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Evaluating the Nutritional Status of Peruvian Born Children

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EVALUATING THE NUTRITIONAL STATUS OF PERUVIAN BORN CHILDREN

by

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ABSTRACT

Background: Rural areas of Peru lack access to healthcare resources and poor nutritional knowledge of what should be given to their children throughout their growth and development. The majority of the rural areas rely on a high carbohydrate, moderate vegetable diet, and lacking a protein source. Lower protein intake can lead to problems of malnutrition and growth stunting. Families rarely have monetary resources to provide a protein at every meal for the entire family. There is also a lack of a clean water supply, free of parasites and helminths. Caregivers often rely on replenishing intake with other fluids high in sugar. These issues create healthcare needs within the community and may go unmet.

Objectives: Identify specific educational needs for children living in rural Peru related to nutrition and health practices. The needs assessment was conducted to create identify specialized programming for children accompanying their parents at a local clinic.

Methodology: Survey analysis was conducted on caregiver responses, related to children under the age of 18 living in Peru. Institutional Review Board approval was obtained at the university in the USA and the clinic in Yantalo, Peru. Caregivers were invited to participate in the study in person or on social media. The explanation of research was distributed and placed as a top sheet prior to the survey ensuring consent. Anonymous survey completion was conducted while in the waiting room, a private office was available upon request. Electronic links were also provided via Facebook on the clinic website.

Results: Approximately 55 participants completed the Peruvian Nutritional Survey. There were 43 in-person surveys completed with an additional 13 online. Demographic data collected included: the average age of the caregiver, 34 years old, and children per household (children). The average home rarely consumed water as a beverage. The primary resource of fluids offered

to children was fruit juice or evaporated milk. Two meals a day are served with a protein, one of which is eggs. The main carbohydrate varied, however; it was offered to the child at every meal. Children under the age of 12 receive immunization at the yearly checkup. There is minimal knowledge related to the purposes of the immunizations.

Discussion: Root vegetables comprise the majority of every meal. Root vegetables are readily grown in the community and are inexpensive. There is a noted lower protein intake in the rural area. Fluid intake is minimally monitored and not seen as a priority. Water is an important source of fluid especially due to the humid climate but is often contaminated with parasites (Cabada et. al, 2015). Filtered water is expensive and harder to locate in the home setting.

Conclusion: Medical attention in rural Peru is scarce and limited. The clinic offers a hub of resources for community families. The caregivers noted they access specialized care when advertised by the clinic. Pediatric well-check is provided annually until the age of 12, while older children only seek medical attention when ill. There is a lack of misinformation and lack of communication about when free healthcare is no longer provided for their children.

Keywords: Peru, children, etc.

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INTRODUCTION

Statement of Problem

Research in rural communities within Peru has been minimal to investigate the differences in feeding practices from urban and rural areas. People that live within the rural cities of Peru lack the access to clean water, ability to visit physicians and hospitals, and access to grocery stores where they can buy their food (Sobrino, Gutiérrez, Cunha, Dávila, & Alarcón, 2014).

Compared to the individuals that live in the rural cities, people that live in the urban areas of Peru are able to access those commodities compared to the individuals that live in rural towns.

BACKGROUND AND SIGNIFICANCE

Background

Peru, South America, has achieved tremendous economic growth in the past twenty years. Although Peru as a country has improved substantially through economic growth, the same cannot be said about the health care access in rural areas. The Peruvian Ministry of Health has established several different programs throughout remote regions in attempts to reduce the low socioeconomic status and availability to healthcare resources (MINSA, 2018) . CRECER and JUNTOS are nationally funded programs that Peru has developed to provided families that are below the poverty line with resources that include nutritious food elements, healthcare availability, and access to vaccinations (Sobrino et al., 2014).The MINSA is establishing vaccination campaigns yearly to increase the number of people vaccinated throughout the country. MINSA sets up vaccination campaigns throughout the country to reach children of all ages through school-based and health center locations (MINSA, 2019b).

Citizens of Peru have two options regarding their healthcare that is provided by the Peruvian government. (Guimarães et al., 2015). Private and public health care is offered, people who are able to afford private healthcare will have access to better resources to get the care they need. Within the public healthcare provided to the Peruvian citizens, patients must pay out of pocket for the different services provided by the clinic if their healthcare insurance does not cover country (Guimarães et al., 2015).

Some of the regions that limited access to healthcare include the Andes, Amazonian, and the Sierra regions (Hernández-Vásquez & Tapia-López, 2017). Due to the geographical barriers of these areas in Peru, people that live within these communities must travel for days, sometimes even on foot before they reach the nearest clinic (Guimarães et al., 2015). The public clinics are spread throughout the towns located in the town center, making it difficult for people to reach the clinics. The lack of clinics available to citizens living in remote regions limits the access they are able to visit the local physicians. For example, children living in the town of Iñapari only had high access to healthcare when they were ill, but low access for routine checkups (Guimarães et al., 2015). This allows for some medical conditions that are usually preventable in first-world countries to go undetectable in Peru. Researchers report that malnutrition and anemia are common conditions in these rural areas that could be prevented if children were seen by a physician monthly instead of yearly (MINSA, 2018).

Anemia

According to the Demographic and Family Health Survey (ENDES) collected from 2000-2011, the major contributing factor stunting children's' growth and development included malnutrition, anemia, and the occurrence of parasitic infections (Sobrino et al., 2014). In addition, anemia levels have been reduced more in urban children while remaining high in rural

areas. In the region of Paucartambo, located in the highlands of Peru, researchers surveyed 295 children under the age of five years old to detect the prevalence of parasites, malnutrition, and anemia. About 77% of children from three to four years old were diagnosed with anemia and 36% of children from five to twelve years old were diagnosed with anemia (Cabada et al., 2015).

Another study conducted by the Pan American Health Organization (PAHO) and MINSA had similar findings, about 43.6% of children from 6-35 months of age were anemic (Sobrino et al., 2014). After these results were shared with the public, the Peruvian government initiated the program CREECER to prevent these issues from continuing. The purpose of the program CREECER is to improve the low birth weights, improve nutrition for children under three years old, and reduce respiratory infections and diarrheal infections for children under two years old (MINSA, 2018). The Peruvian government made it their goal to help provide resources such as food and medication for families with low socio-economic status. Although there is some progress being made to decrease the malnutrition rates, there is still a challenge to ensure that some of the most remote Amazon and Andean rural areas are receiving this aid as well (Huicho et al., 2016).

Malnutrition

In the year 2000, the mortality rate for children under five years old was 38.7 deaths per 1,000 births (UNICEF, 2017a). In 2010, the mortality rate for children under five years old had decreased to 20.3 deaths per 1,000 births. The latest update in 2017 was that the mortality rate for children under five years old had decreased to 15.0 per 1,000 births (UNICEF, 2017a). The mortality rate has decreased in the past twenty years, but there is not sufficient information recorded to compare the differences in mortality rates from the urban to rural areas in Peru.

Malnutrition is caused by the inadequate nutrition provided to the children as parents are unaware of a healthy diet education and lack the resources to purchase nutritional food. According to Hernández-Vásquez and Tapia-López (2017) the current analysis of food consumption in Peru there is an increase in the caloric intake of foods that are rich in saturated fats. However, the consumption of proteins and fat has stayed the same across the national survey. Although there is a normal amount of protein and fat consumption for children, the Food and Agricultural Organization, a branch of the United Nation, shows that children under three years old do not meet the daily energy requirement (Hernández-Vásquez & Tapia López, 2017). The children who are experiencing this deficiency live in the Sierra or the jungle, or communities within Peru that are impoverished.

Families are forced to give their children a high amount of carbohydrates compared to proteins and fats is because of the geographical barriers of these communities, families usually eat the food they produce (Andrissi, L., Mottini, G., Sebastiani, V., Boldrini, L., & Giuliani, A., 2013). It becomes difficult for some of these communities to go out to town weekly to buy foods that are high in protein and healthy fats. Due to the low consumption of proteins in children living in rural areas, anemia is commonly seen as a health problem in these towns.

Parasitic Infections

The main causes of anemia are malnutrition and soil-transmitted helminths (Cabad et. al, 2015). Soil-transmitted helminths (STH) account for just one of the organisms found in the drinking water in rural communities in Peru. There are numerous amounts of parasites and protozoans causing continuous diarrheal episodes in children. Continuous diarrheal episodes caused by the intestinal parasites have led to dehydration, malabsorption, and malnutrition (Cabada et. al, 2015). In the region of Paucartambo, there were approximately seven different

types of parasites found in the stool samples collected from children in this region. These recurrent parasitic infections are responsible for stunting of growth, chronic inflammation, malabsorption, and blood loss (Cabada et. al, 2015). Iquitos, a city located in the Amazonian jungle of Peru, had similar findings during a longitudinal study that showed that children two years of age had the greatest complications from these parasitic infections. Children that had been infected with any intestinal parasites between one and two-years-old had lower cognitive and verbal abilities later in childhood (Blouin, Casapia, Joseph, & Gyorkos, 2018).

This occurrence of STH or parasites is due to poor sanitation, poor hygiene, and low socio-economic status. About nine percent of Peru's population have unimproved or limited drinking water. Unimproved water indicates that it takes more than thirty minutes to reach water access while limited water indicates that the water is not protected or tested for parasitic contamination (UNICEF, 2017b). Choi and Kim (2017) discovered that 76.2 % or 141/185, of the participants in the region of Huanuco, drank natural or tap water compared to only 21%, 39/185, who drank boiled or mineral water. Natural or tap water is the only source of water in some of the rural regions of Peru. The tap water or natural water that children in rural communities' drink is usually unfiltered or untreated as urban areas only have access to clean water (Cabada et. al, 2015). This tap or natural water is predominantly contaminated with from runoff materials from the livestock . In addition to these children living in remote communities that do not have access to drinking clean water, they are not taught basic hygiene practices. Children and their caregivers become contaminated with *E. coli* due to poor hygiene practices, such as not washing their hands after using the restroom or inability to wash their hands because of the contaminated water (Hartinger et al., 2013). Food was also found to be contaminated with *E. coli* colonies due to the use of kitchen utensils contaminated when washed with tap water.

Hartinger et al. (2013) reported that about 27% of *E. coli* organisms were found on meals, compared to the kitchen utensils and drinking water.

Immunizations

Fifty percent of the children in Peru have received their second dose of measles vaccination according to the 2017 data collected through UNICEF (UNICEF, 2017a). Due to low vaccination rates particularly in rural areas, the Ministry of Health creates several vaccination initiatives throughout the year to vaccinate the children during the school day to ensure that everyone is immunized.

The most recent vaccination campaign began in June 2019 after 42 cases of measles, mumps, and rubella were reported in Peru (MINSA, 2019b). The Ministry of Health made it their mission to achieve 95% of vaccination rates in the San Martin and Pasco regions. The vaccination campaign began on June 1st through the 30th in attempts to vaccinate thousands of children without measles, mumps and rubella vaccination (MINSA, 2019b). During this time, healthcare workers went house to house encourage caregivers to vaccinate their children. As a result of this campaign, about 200,000, boys and girls younger than 11-years-old were vaccinated against measles, mumps, and rubella (MINSA, 2019c). The Ministry of Health recognizes that this is just the first step to increase vaccination rates throughout the whole country, especially in rural areas where compliance rates are lower. The Peruvian Ministry of Health understands that these diseases could cause harmful long-term effects if the people are not vaccinated (MINSA, 2019c).

One particular vaccination that the Ministry of Health is trying to push is the human papillomavirus vaccination (HPV). The Ministry of Health in Peru is aware that HPV is affecting millions of women living in Peru as a result of low accessibility to yearly screenings offered

throughout Peru (Abuelo et al., 2013). The Ministry of Health has strongly advised parents and caregivers to vaccinate their daughters against HPV and has provided the vaccine in schools. This year the Ministry of Health made it their goal to vaccinate around 260,000 children this year against this disease that can cause cervical cancer in the long run (MINSA, 2019a). PERCAPS, a Peruvian Cervical Cancer Prevention study, is a community based participatory research project with the purpose of developing a cancer screening model to be offered in impoverished towns. Abuelo et al. (2013) chose to start this program in the surrounding region of Iquitos, near the Amazonian jungle, as the geographical barriers prevented yearly screenings to be available. The researchers discovered that in order to receive high vaccination rates, girls should be vaccinated in school instead of relying on their parents to bring them to the town clinics. Abuelo et. al (2013) found it difficult to administer the HPV vaccine to all the women living in the community, as the Peruvian government only allows girls to be vaccinated from ten-years-old to thirteen-years-old. Researchers also believed that if they vaccinated the girls, then when the healthcare providers visited the rural towns, they could just focus on women that were prone to cervical cancer or screen women that could have cervical cancer (Abuelo et al., 2013).

Significance

The significance of this study can show the differences in caregivers' perception that live in rural areas compared to caregivers that live in urban areas. It also shows the importance of making sure that the national programs created the Peru Ministry of Health are reaching these areas that do not have the same resources as other areas. The research will help identify targeted areas within the Yantalo surrounding region.

PURPOSE OF STUDY

The purpose of the research is to investigate the nutritional status of Peruvian-born children based on their caregiver's opinions.

Research Aims

1. Explore the types of nutrients that caregivers in Peru provide their children throughout the day.

2. Explore if children have access to health care and the frequency, they are able to visit their primary care provider.

METHODS AND PROCEDURES

Design

A descriptive quantitative study measured the types and quantities of food elements that Peruvian caregivers provide their children throughout the day. The rationale for selecting this type of research is that a baseline of information needs to be established to see what the Peruvian families in the Yantalo surrounding region. The descriptive quantitative study investigated what the caregivers are giving their children to eat throughout the day, quality or access to drinking water, and if the participants and their children have access to a primary care provider.

Subjects

The population sampled in this study are Peruvian-born children under the age of 18 being cared for in the home and attending the Yantalo Foundation Clinic. The survey targeted any Peruvian caregiver over the age of eighteen caring for a child aged from birth to eighteen investigating the nutritional status of these children. The participants were recruited through social media platforms, such as Facebook where the recruitment flyer will be posted.
These recruitment flyers were available to the participants in Spanish and English. The flyers were also posted throughout the Yantalo Foundation Clinic informing the potential participants of the research study taking place.

Inclusion and Exclusion Criteria

Inclusion criteria: Participants in the study must be at least 18 years of age, with children under the age of 18 currently living in Peru visiting the Yantalo Clinic.
Exclusion criteria: Participants under the age of 18 or participants that had children over the age of 18.

Procedures

The data was collected by the primary investigator or co-investigators after the participants have completed the anonymous survey. The participants were assigned a study code and no identifiers will be collected on the survey. The data was stored in a double-lock safe where only the primary investigator have access to the data. The data was stored for two months until the co-investigator analyzed the data collected to see the trends in food patterns. After the data is analyzed, surveys will be destroyed.

Instruments

The instruments used for this research study include an eight-question questionnaire (appendix A) printed on a piece of paper or the link to the Qualtrics survey will be provided on a tablet if requested by the participant.

The survey questionnaire has been reviewed and approved by the Institutional Review Board for human subjects at the University of Central Florida (appendix B). A review of the questionnaire by the clinic in Peru was not conducted as there is no Institutional Review Board in place in Yantalo, Peru. Although, there was no IRB approval of the questionnaire, the director and founder of the Yantalo International Clinic approved the questionnaire and research taking place at their location. Any participant that was interested in participating in the survey was given an explanation of research through the bilingual co-investigator and the participants that wanted to continue with the study were given the consent form. Verbal consent in Spanish was obtained from the participants as some participants were illiterate. Consent was obtained prior to any participant completing the study.

Data Analysis

This study used descriptive statistics to analyze the research questionnaires. Frequencies and percent were run on all variables. The variables were explored to create average scores to use in analysis.

Results

Sample Characteristics

The caregivers that were invited to participate in this research study had a scheduled appointment with the Yantalo Clinic in Peru. The participants were recruited while waiting to see a doctor and were given the explanation of research and if consented, began to fill out the survey. The participants were given the opportunity to utilize a private office to fill out the survey if needed. These caregivers were also recruited through social media, such as Facebook, where the survey was posted on Yantalo Clinics Facebook page. About 56, caregivers participated in the research study. 76% of the caregivers participated in the survey in person, while 23% of the caregivers participated in the survey online.

Demographic sample

The sample collected was predominantly Hispanic female (76.6 %, n=43) about 7% of Hispanic males participated in the survey (n=4). There were some limitations in collecting demographic data on the questionnaires filled out online. Some participants chose to omit their demographic data, such as age and their gender. The mean age for the participants was 29.69, with the youngest participant being 19 years old and the oldest being 54 years old. Some of the other demographic data that were collected included how many children did each caregiver has and how old was each of their children. Each caregiver had an average of 2 kids per household and the average age for the children was about 7 years old.

Although the majority of the participants that completed the survey were female, there were certain caregivers that needed assistance filling out the survey from the investigators or even from their children. A couple of the caregivers that participated in the survey were illiterate or unable to write which caused their children to fill out the survey.

Research aim 1: Explore the types of nutrients that caregivers in Peru provide their children throughout the day.

The majority of the caregivers reported giving their children a variety of food to eat throughout the day. The nutrients that had the highest category of being provided to their children included, legumes, rice, proteins, and vegetables. Rice (n=31) and potatoes were given in every meal, often two to three times a day. There were a couple of households that reported giving a carbohydrate at least four times a day. When caregivers were asked what type of protein, they provided their children, there were mixed reviews and lack of information given to caregivers about the best type of protein they should provide. For example, one family stated that they didn't give their children chicken or pork to eat because they were scared of the hormones that were given to these animals. When asked where they discovered this information, they responded by saying "Oh my neighbor told me". This is an important cultural point to shed some light on as neighbors in Peru are very close and rely upon on each other for information. The Peruvian culture, along with other Hispanic cultures, rely and take value in their neighbor's and family members opinions. One of the biggest concerns about giving children vegetables and fruit to eat throughout the day was if the vegetables or fruit were clean of parasites and helminths. The majority of the caregivers responded that their children rarely had issues from eating the vegetables or the fruit grown in the area but were aware that local water sources were often contaminated.

Some of the carbohydrates that were provided throughout the day included, rice, potatoes, cassava, and sometimes given corn to eat throughout the day. The average carbohydrate was served at least twice a day, typically being served in lunch and dinner. Rice was served for every meal and was provided every day to the children. Although the caregivers surveyed

traveled from different areas to reach the Yantalo clinic, there was a consensus of providing rice and potatoes at every meal. Rice and potatoes, along with other carbohydrates are cheaper to provide compared to buying chicken and other meats. Some families responded stating that they provided a carbohydrate at least four times a day.

Caregivers were also surveyed to see the type of beverage they provided their children throughout the day as well as the frequency that their children were drinking fluids. Replenishing fluids is often important for children living in the Yantalo area as it is humid and can cause children to become dehydrated. Multiple of the caregivers surveyed responded that they gave their children water infused with different types of fruit and fruit juices to drink throughout the day. The water given to the children was often boiled or provided in a water bottle. When the caregivers were asked where they had learned this information about boiling their water, many caregivers responded stating they had learned it from their parents and that the local governments rarely educated the public about contaminated water. Approximately only one to two caregivers mentioned that they do not boil the tap water, but their children never had diarrhea or stomach issues from the water source.

Another type of fluid that caregivers often provide their children with is milk. Caregivers often provide their children with Gloria Evaporated Milk. Numerous caregivers stated that they provided their children with Gloria milk compared to regular milk. Only a couple of caregivers stated that they give their children coffee, hot chocolate or oatmeal to drink throughout the day.

Research aim 2. Explore if children have access to health care.

According to the caregivers, children are given a “control” which means that kids are given free healthcare and are able to visit their local clinic a couple times a year. There was difference noted in between each caregiver and there wasn’t a concise answer until when the free

healthcare was not accessible anymore. Caregivers gave different responses until what ages their children received free health care, and this indicated how many times the children were able to visit the local clinics. Some parents were able to take their children to the clinics (n=12) monthly while other parents rarely (n=0) took their children to the clinic at all. Usually the parents that took their children to the clinic every month had children younger than three years old. Parents that have children in their teenage years only take their children to the clinic about once a year or only visit the local clinics when the children are sick. Often parents' resort to natural medicine or visit the local pharmacies instead of visiting the local clinics due to the long waiting times and lack of accessible physicians.

Some of the caregivers also have difficulty getting time off from work. Numerous caregivers mentioned that this is one reason why caregivers are unable to take their children to the doctor's appointment. One of the participants mentioned that she was written up if she missed a day of work even if it was to take her children to the doctors. Numerous urban towns have clinics located in the city, on the other hand, rural towns often have to travel a couple of hours to reach the nearest clinic. For example, some people that visited the Yantalo clinic traveled up to six hours to visit the clinic. In addition, these local clinics lack specialists if they have a referral or need to visit one. If a child needs to see a specialist, they often have to travel to a larger city where the caregivers need to take time off from work and often do not have the financial means to travel outside the town.

DISCUSSION OF FINDINGS

Research aim 1. Explore the types of nutrients that caregivers in Peru provide their children throughout the day.

Majority of the residents living within the Yantalo surrounding region provided their children with similar foods to eat throughout the day. Caregivers were worried about the quality of meat they were providing their children, as they had been informed about the potential use of growth hormones being added into their meals. Throughout filling out the questionnaire, caregivers asked the investigators what types of nutrients would be best for their children. For example, one mother that filled out the questionnaire asked about diabetes education for her children. The caregiver did not know what diabetes mellitus was and did not know which types of food would be best for her child.

The types of carbohydrates that were provided throughout the day included rice, potatoes, and cassava root plant. Majority of the caregivers provided their children with some type of carbohydrate at least twice a day. Some caregivers provided a carbohydrate at least four times a day throughout the meals. For example, one of the caregivers that filled out the survey had twelve children and when asked why they were fed mainly carbohydrates in their meals, the mother responded by saying it is the easiest thing to provide. This mother also had her youngest son fill out the survey as she was illiterate and unable to write in Spanish. Her son was able to read and write but did have some spelling issues when filling out the question.

Numerous families stated that they have been educated about the dangers of providing their children with tap water. When asked where they had learned this information since tap water is usually filled with parasites and helminths, caregivers responded by saying they were usually taught by their parents or their elders. Caregivers living out in rural areas stated that they

have not been educated about the dangers of the tap water from the government. If caregivers need to use tap water, they usually boil it before using it. But also, some caregivers noted that they have given their children tap water and they did not have issues with their children developing symptoms from drinking the water. In addition, some caregivers have mentioned that there are government officials that visit the rural schools and provide the children with antibiotics prophylactically. Although this statement cannot be proven, several caregivers provided this information after completing the survey.

Another popular drink that is given to children throughout the day is the Gloria Evaporated Milk. Majority of the mothers with children that visited the clinic stated they provided their children with this milk instead of regular milk produced from cows. Caregivers have stated that it is easier to provide their children with evaporated milk as you do not have to keep it refrigerated while whole milk needs to be in the fridge. One caregiver that completed the survey had a nine-month old daughter and was giving her child the Gloria Evaporated Milk. According to the American Pediatric Academy (2020), children should not be provided with whole milk until the child is about a year old. The same information cannot be said if the mother had been educated about this when should infants be switched from formula to whole milk. The investigators educated the mother about when she should provide her infant with the Gloria Evaporated milk but recommended for her to check with the pediatrician.

According to the survey analysis, numerous caregivers gave their children legumes, rice, and protein to eat throughout the day. Root vegetables and carbohydrates are easily available and grown in the local areas making it easier for caregivers to provide it to their children. Due to the nature of providing a high quantity of carbohydrates and a low intake of protein per day, children in Peru are often malnourished and anemic. Although the children were not weighed to see if

they weighed appropriately for their age group, there is sufficient research to show that if children are not provided a high protein intake throughout their development, it can stunt their growth (Hernández-Vásquez & Tapia-López, 2017). Not only will children have malnourishment issues with a diet low in protein intake, but can also become anemic leading to other developmental issues (Sobrino et al., 2014).

Research aim 2. Explore if children have access to health care.

There was no general consensus if children were provided free health care. There were different answers expressed from the caregivers regarding this research aim. Some caregivers stated that they were given free health care until pre-adolescent ages while others stated that they only received free health care until the ages of seven. Infants and toddlers were given free health care and needed to visit the local clinics monthly. Because of this lack of communication in the types of affordable care offered the Peruvian people, they ended up only visiting the local clinics when they are ill. Majority of the participants that visited the Yantalo clinic stated that they usually use natural medicine or visit the pharmacy when they are sick. They often have to wait long periods of time in the local clinics and their issues are not addressed by the physicians.

Some children were able to visit their primary care physicians at least once a month while others only visited their doctor once a year or when they were ill. This is usually common with older children as they do not have access to health care or unable to visit the local clinics frequently. Caregivers are usually able to take their children to the local clinics up until two years of age as they are provided free healthcare, but this is not true for all. Some caregivers that have young adolescents or teenagers have access to health care and are able to visit the local clinics where they are informed about sexual education and track their growth. When asked other caregivers that participated in the study if there were given the same access to healthcare with

their teenage children, different responses were given. Majority of the parents stated they were unable to take their children to the clinics as waiting times are long or they are unable to take time off of work. Some participants also stated that they rarely take their children to the clinic, and at times never visit the local clinics.

LIMITATIONS

This study had several limitations. a language barrier was noted and created a miscommunication between the investigators and the participants of the study. The investigators knew several native words in order to hold a conversation with the participants, but the regions of Peru have different dialects that create miscommunications. Because of this language barrier, participants had difficulty understanding the survey questions or could not answer the question accurately. A translator was utilized for the study where the survey questions were translated to Spanish. The cultural norms and the contextual dialect made it difficult to communicate with the participants at times.

Another limitation that was noted was that when the questionnaire was completed online, participants were able to skip some of the questions they did not understand or did not want to answer which skewed the data. For example, some participants skipped the questions that included the demographic data or how many times throughout the year they visited the local clinics. This made the data harder to analyze as it impacted the average and the percent of each questioned asked.

NURSING IMPLICATIONS

This study can be used as a reference in future studies, and also can be used as a baseline data point for future nursing students attending the Yantalo Clinic in Peru. Future nursing

students could create educational topics that caregivers could learn from while waiting at the Yantalo Clinic. Unfortunately, the investigators were not able to do education sessions due to the timing, but future nursing students could visit the local schools and inform the students about proper nutrition and hydration especially in the humid climate.

SUMMARY

In conclusion, there were some similarities in the information collected from the background research to the data that was collected. Majority of the meals in Yantalo surrounding region include one to carbohydrates in every meal and at times given up to four times a day. A protein is included in a meal at least once a day and ranges from eggs to pork. Majority of the caregivers surveyed they were nervous to provide their children with pork and red meat due to the concern of hormones being added into animals. Majority of the families stated they gave their children chicken and fish to eat throughout the day and rarely gave their children pork. Eggs were provided at least once to twice a day. Fluid hydration is important due to the climate of the region, but children are often given fruit juices made from fresh fruit but are rarely provided water to drink throughout the day. Parents are aware of the dangers of drinking tap water and usually boil the water before giving it to their children, but this is not the set standard. Some parents are unable to buy bottled water continuously, so they often resort to giving their children fruit juice.

Visits to local clinics and visits to their primary care providers varied as it depended on the parent's schedule to take their children. Parents often are not able to get enough time off from work or do not wait to spend an entire day waiting to be seen at the local free clinics. Some children are within the age ranges to receive free health care provided by the government while

older children are not able to receive these benefits. This is one of the main reasons why older children rarely visit their primary care providers.

APPENDIX A: Survey Questionnaire in English

1. What types of food do you eat on a daily basis?

Rationale: Lack of knowledge in knowing that certain food groups need to be given for children to grow is a cause of childhood stunting in urban and rural areas in Peru. Most mothers with younger children reported feeding their children meals that included cereals, potatoes, and rice. Due to the increase in the consumption of carbohydrates, families often report low consumption of protein and healthy fat. As a result of the low intake of dietary protein, anemia rates are high in the rural regions of Peru.
(Rogers, B.L., Rajabium, S., Levinson, J., Tucker, K., 2002, p.13).

2. On a daily basis, how many servings of potatoes, corn, and rice do you eat?

Rationale: People in rural areas tend to feed their children plant-based food lacking protein intake causing low levels of iron lead to anemia. Some regions of Peru, specifically the Sierra and Amazonian jungle report a low consumption of protein, relying specifically on food that families grow in these areas. Due to the poor consumption of protein, children between 12-35 months have an energy deficiency as they are not receiving sufficient calories from the plant-based diet.
(Rogers, B.L., Rajabium, S., Levinson, J., Tucker, K., 2002, p.13).

3. What do you give your child to drink during the day?

Rationale: Peru is a country that lacks access to natural water free of parasites causing mothers to give their children beverages that does not include water. Also, if mothers do provide their children with water, it is usually filled with parasites and bacteria that can cause diarrhea. Continuous diarrheal infections caused by intestinal parasites have led to low birth weights and malnutrition.
(Rogers, B.L., Rajabium, S., Levinson, J., Tucker, K., 2002, pg. 5).

4. Based on the previous answer, how many times a day do you provide your child with that beverage?

Rationale: There is a 10% decrease in the real price of carbonated soft drinks increased consumption in 13% in the sample of young families (and in 10% in the general population), BMI in 0.5%, and obesity rates in 8.5% among adult women of childbearing age. The estimated effects on consumption and weight outcomes were greatly higher for women living in houses without running water (Ritter, P. I., 2015, pg. 15).

5. What is your availability to access milk?

Rationale: Peru has one of the highest rates of breastfeeding their children but also has high rates of non-human milk being introduced to infants very young. If infants are introduced to foods other than breast-milk, it reduces the quality of nutritious food being fed to the child.

6. How often do you visit a doctor for a wellness check compared to a visit when they are sick?

Rationale: Mothers that live in the rural areas of Peru only have a secondary level of education, usually unaware of the symptoms of malnutrition and other health conditions common in Peru. Also, there is a link between the parents' education to characteristics associated with childhood stunting.
(Rogers, B.L., Rajabium, S., Levinson, J., Tucker, K., 2002, pg. 8).

7. How often do you get to weigh your child?

Rationale: Mothers in rural areas of Peru often lack the resource of going to a traditional OB-GYN practice during their pregnancy and often result in other resources outside of the traditional health care system. Because of this, doctors often result in mother's perceptions about if their baby is "small", "very small", or "tiny". Without accurate measurements of weighing throughout pregnancy and birth of a child could lead to childhood stunting developments (Rogers, B.L., Rajabium, S., Levinson, J., Tucker, K., 2002, pg. 14).

8. Are each of your children vaccinated?

Rationale: In the areas of intervention, the share of children under 12 months fully vaccinated and whose families received support in tracking the children's growth, health, and nutrition indicators and counseling to foster behavioral changes through community-based demonstration sessions (i.e., Control de Crecimiento y Desarrollo or CRED packages), reached 86.4 percent in 2016, up from 63.9 percent in 2011. The percentage of children under 36 months that received complete CRED packages settled at 70 percent in 2016, up from 67 percent in 2012 (The World Bank, 2018).

APPENDIX B: Survey Questionnaire in Spanish

Cuestionario Pediátrico Yántalo

Translated By: Titus Language & Educational Services®™ _

Su Edad:
¿Cuántos hijos tiene (usted)?
¿Cuántos años tiene cada uno de sus hijos?

1. ¿Qué clase de comida o alimentos comen sus hijos diariamente?

2. Diariamente, ¿cuántas raciones de papas, maíz y arroz comen sus hijos?

3. ¿Qué le da usted a sus hijos de beber durante el día?

4. Basado en la respuesta anterior, ¿cuántas veces al día usted le da esa bebida a su(s) hijo/a(s)?

5. ¿Tiene leche a su disponibilidad? Sí está disponible, ¿cuán a menudo se la da a su(s) hijo/a(s)?

6. ¿Cuán a menudo lleva a su(s) hijo/a(s) a visitar un doctor si no está(n) enfermo/a(s)?

7. ¿Cuán a menudo pesan a su(s) hijo/a(s)?

8. ¿Está(n) cada uno/a de sus hijos vacunados?

APPENDIX C: IRB Approval

UNIVERSITY OF CENTRAL FLORIDA

Institutional Review Board
FWA00000351
IRB00001138
Office of Research
12201 Research Parkway
Orlando, FL 32826-3246

EXEMPTION DETERMINATION

May 24, 2019

Dear Desiree Diaz:

On 5/24/2019, the IRB determined the following submission to be human subjects research that is exempt from regulation:

Type of Review:	Initial Study, Category
Title:	Peruvian caregivers perspective on nutritional status of their Peruvian children
Investigator:	Desiree Diaz
IRB ID:	STUDY00000506
Funding:	None
Grant ID:	None

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made, and there are questions about whether these changes affect the exempt status of the human research, please contact the IRB. When you have completed your research, please submit a Study Closure request so that IRB records will be accurate.

If you have any questions, please contact the UCF IRB at 407-823-2901 or irb@ucf.edu. Please include your project title and IRB number in all correspondence with this office.

Sincerely,

Gillian Morien
Designated Reviewer

APPENDIX D: Types of foods provided per day

Table 1: Type of foods provided per day (n=148)	Quantity	Total
Legumes	IIIIIIIIIIIIIIIIIIIIIIIII	28
Rice	IIIIIIIIIIIIIIIIIIIIIIIIIIIII	31
Proteins	IIIIIIIIIIIIIIIIIIIIIIIIIIIII	32
Fruit	IIIIIIIIIIIIIIII	18
Cereals	IIII	4
Soup	IIIIIII	8
Vegetables	IIIIIIIIIIIIIIIIIII	22
Bread	IIIII	5

APPENDIX E: Types of beverages provided

Table 2: Type of beverage provided per day (n= 91)	Quantity	Total:
Milk	IIIIIIIIIIIII	15
Water infusions	IIIIIIIIIIIIIIIIIIIIIIIIIIII	30
Fruit juice	IIIIIIIIIIIIIIIIIIIIIII	27
Gloria (Evaporated Milk)	IIIIII	6
Maternal Milk	I	1
Oatmeal	IIIIIII	7
Hot chocolate	I	1
Coffee	IIII	4

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