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The perception of iron-deficient anemia in Bolgatanga, Ghana among women of childbearing age

Sydney Albrecht

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EMSON Student Nurse

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Abstract:

Objective: To understand the perception of anemia among the women of childbearing age in Bolgatanga, Ghana, and to correlate the reasoning with the high incidence of anemia in the area.

Method: This research was a qualitative study consisting of 67 interviews over the course of the three weeks that were spent in Bolgatanga. 50 of these interviews were women of childbearing age (15-49), 6 were health professionals, and 11 were women older than the age range provided. Interviews were taken from the maternity clinics nearby as well as from women in a rural area that was a 10-minute taxi ride from the place in which the program was held. Quantitative data was collected through 160 hemoglobin tests that were conducted in order to prove that anemia is prevalent within the town of Bolgatanga among women of child-bearing age.

Results: There were many different factors of perception such as the interpretation the women had of anemia as a process, the root cause of anemia, cultural taboos, and perception of facilitators and barriers of access to combat and prevent anemia.

Conclusion: It is imperative to understand the community before conducting public health initiatives to ensure that teachings are accurate and tailored to the culture and mindset of the audience that it is presented to.

Introduction

It is important to understand, as a woman studying in the Western world under the ideologies and influence of Western medicine, that egocentrism is a thief to understanding. It is something that has created a medical world that leads in science and technology and at times lacks the holistic nature in examining the body, mind, and spirit. There are different ways to perceive and comprehend medicine than what is taught in nursing school, and no one way is of lesser or greater value than another. It is important to incorporate all teachings around the world in order to get the most wholesome perception of medicine. As Western medicine becomes increasingly globalized throughout the world, it's imperative to analyze, from a public health standpoint, that there are many things that must be altered in teachings in order to best fit an audience. It is important to gather information about a culture before intervening and teaching one way of preventing and caring for an illness. There is no purpose in teaching on a subject that may conflict with cultural practice. This is the purpose of this research that I have conducted.

I traveled to Bolgatanga, Ghana on a Faculty-Led Study Abroad Nursing program and had the opportunity to conduct my interviews and hemoglobin testing. I was able to live within the community for three and a half weeks and interact with the people in clinics and throughout the village daily. I got accustomed to living there throughout the month that I resided in Bolgatanga and adored the culture and community. The people are warm, friendly, and excited to meet new people from new lands. I am aware that one month is not enough to understand an entire people, and that my research simply begins to explain this complex culture. However, I am attempting to encompass as much information about the way that iron-deficiency anemia plays a role in the lives of women in Bolgatanga. I inquired if these women acknowledge anemia's presence, how they perceive its presence, and if they believe care is accessible or needed. I wanted to discover the different reasonings behind certain

taboos and begin to understand the differences from the research I have read about in the south of Ghana near Accra along the coastal region.

Everything within this world is interconnected and it is imperative that researchers look at situations holistically. This research was conducted to conclude the reasoning behind the high prevalence of iron-deficient anemia in Bolgatanga, Ghana. There were many articles on southern Ghana that I had found, but as literature states the north and south of Ghana are quite different. The north and south of Ghana do not speak the same language, nor do they hold identical cultural beliefs. The south of Ghana speaks a language called *ashanti* and the north speaks primarily a language called *frafra*. With every health initiative there are barriers and facilitators that either prevent or promote the ease of combating and preventing an ailment. The Ghanaian culture in the north is a beautiful, unique creation that has many deep roots that hold taboos and beliefs that cause them to participate in certain actions. I was interested in what the women had to say in a patriarchal society, and to hear why they believed anemia was so common among women. I also wanted to understand what their own understandings were of what they considered to be anemia. Perhaps they did not know what it was, perhaps it did not exist in their culture, and perhaps there were certain cultural practices that were linked to the high prevalence. These were the questions that struck me as I began to ponder the ideas of cultural ties, public health, and the way people from across the world live their lives with this symptom of illness.

Bolgatanga is a poor, developing city, and many people are in a state of poverty. There is public transportation of taxis and cars, and people own bicycles as well. Building structures and architecture are well-made and they have a sufficient road system and adequate infrastructure. The country was originally taken over by the English, which is considered globally to be their country's language, and the people of Ghana speak English. However, there are different, Ghanaian languages that are still used within the community. If a person had access to education, they were able to speak English very well, otherwise they typically spoke their native tongue.

The people in the communities in which I conducted interviews with a translator consisted of family houses and various families that live in the same house. The interpersonal culture of Bolgatanga is familial whether there is blood relation or not. They call one another "momma" "fada" "sista" and "brotha" whether or not they are related by blood lineage.

As a clinical team of student nurses from the University of Arkansas, we had the privilege of learning from and working alongside the nurses and physicians at two different clinics that were highly utilized in Bolgatanga. The clinics that I worked and interviewed in had different wings for different types of patients, triage, and labs. Their resources are quite limited in comparison to the United States. Their equipment is outdated, and some equipment does not function at all. However, they are able to provide treatment in a practical way in order to get the patient what they need.

These cultural aspects all tie into the way in which they interpret the world around them, including medicine and health. This study was conducted to learn what the women of Bolgatanga thought about iron-deficiency anemia so that further research and teaching can be tailored accordingly.

Literature Review

Anemia is a disease recognized by Western medicine as a condition caused by an insufficient amount of normal red blood cells that leads to poor oxygenation throughout the body (Capriotti, 2016). Western medicine has many different reasoning behind this process that is a symptom of disease such as hemorrhage, blood loss, insufficient intake, decreased absorption, genetic disposition, medication side effects, and iron-restricted erythropoietic individuals (Camaschella, 2015). Anemia affects two billion people around the world, has major health implications, and according to the World Health Organization, there is a concentrated amount of cases within developing communities (Engmann et al., 2007). According to Koram et al. (2000) it is very likely that the cause of death in children and mothers is due to anemia. In the Kassena-Nankana district of northern Ghana, Koram et al. (2000) noted a correlation between anemia endemic in

communities and the prevalence of childhood malaria with 22.1% of anemia cases seen at the end of the high malaria transmission season compared to 1.4% of anemia cases seen at the end of the low transmission season. Thus, malaria must also be treated and prevented to benefit the efforts to extort anemia (Koram et al., 2000). This program was conducted during the season of increasing rates of malaria diagnoses. This could have played a role in the high rates of anemia found in Bolgatanga. According to the Ghana Demographic Health Survey (Quartey, 2012), maternal mortality rates related to anemia are 451 per 100,00, representing a 20% increase in deaths from 2010 to 2011. Anemia can cause many health implications if it goes untreated, with women from developing countries reporting symptoms of 'low blood' and various others that differ from that of Western medicine perception (Galloway et al., 2002). It is important to understand that every culture may have a different perspective of what anemia is and how it affects the human body. Galloway conducted a study in eight different developing countries in which people reported having symptoms varying from 'not enough blood' in the body to the belief that a woman may hemorrhage at birth if they consume iron during pregnancy (Galloway et al., 2002). Anemia perception analysis is a first step in increasing the awareness within communities, preventing the disease, and treating those affected by anemia.

Low iron levels resulting in anemia in childbearing aged women and their children may be impacted by their living situation and circumstances. The Ghanaian society is typically patriarchal with men eating more meat traditionally than women, and children. Ghanaian women breastfeed for shorter periods of time and turn to weaning with *koko*, a traditional fermented, low-nutrient maize porridge, by the child's third month of life (Onofiok & Nnanyelugo, 1998). The women begin supplementing at 6 months, but in opposition to this article, the women seemed to breast feed for a longer period of time in reality. Additionally, people of low-income communities rarely eat things that are higher in price which typically positively correlates with iron concentration (Onofiok & Nnanyelugo, 1998). Foods such as meat, eggs, and fish do not typically get fed to children of lower socioeconomic status due to expense, access, and lack of nutritional knowledge (Onofiok & Nnanyelugo, 1998). Although these outcomes seem bleak, more recently there have been many interventions to help Ghanaians improve their overall health and fight against this preventable disease process through nutritional education within the margin of cultural norms and competence.

Many research explorations demonstrated ways in which the Ghanaian people can make lifestyle changes that will lessen the number of anemia cases within the area. Quartey (2012) noted a necessity to encourage mothers to supplement their breastfeeding in order to give essential nutrients to the child such as Vitamin A and iron-folate to prevent the child from becoming anemic. Onofiok and Nnanyelugo (1998) recommended pairing locally available foods that create new patterns of amino acids to meet the needs of infants as well as adults with anemia. Ghanaians can also improve the outcomes of anemic individuals by consuming weanimix, a blend of legume and cereal, that when fermented can add value to its nutrients and be dry milled which makes it much simpler to store without losing its nutritional value (Onofiok & Nnanyelugo, 1998). Although Western healthcare educators can provide as many alternatives to counteract an issue, the people and their cultural perceptions must be taken into account to ensure the efficacy and the implementation to be recognized and utilized within the community.

There are numerous methods to provide health education and disease prevention in order to meet the cultural needs of people. Medicine is deeply imbedded within cultural constructs and, as someone from Western medicine educating people from different cultural groups, I am cognizant that I should abide by the established constructs and alter my teaching for each community. Every community places different weight of importance on different methods of healthcare. Ghana is a country of transitioning cultural traditions and beliefs. Eighty percent of the population of Ghana utilizes either traditional medicine alone or a compliment of Western and traditional care techniques (Dove, 2010). However, Ghana's scarce medical resources may

make transitioning cultural traditions and beliefs difficult. Health educators must blend these two types of healthcare in order to have a sustainable, successful system for the Ghanaian community (Tabi et al., 2006). It must be realized that no culture puts something into practice unless it seems logical for them and their lifestyle. The vast majority of people within Ghana do not solely rely on Western medicine for treatment, therefore teaching methods must possess this pluralistic approach. Food in and of itself is a cultural construct having taboos and stigmas unique to the culture. The way in which people live and their cultural constructs impact the food that is consumed by people and it is impacting health benefits and deficits worldwide (Armelagos, 2014). Some of the southern Ghanaian food taboos include honey can cause respiratory illness, Bambara beans potentially cause respiratory and skin problems in newborns, corn flour is strongly linked to heavy bleeding at delivery, shea butter can cause complications in delivery, eggs, fresh meat, fresh milk, and cold and sugary foods make the unborn baby enlarged, which contributes to a difficult delivery and possible death of the mother (Dove, 2010). These cultural taboos contribute to the reasons why iron-deficiency anemia and other nutritional deficits are heavily prevalent in the south of the country (Dove, 2010). An additional cultural taboo includes believing babies born to mothers who eat snake meat will develop dry, scaly skin after birth, or eating snails will cause the child to be constantly drooling (Arzoaquoi et al., 2015). These beliefs reinforce that, globally, pregnant women hold onto certain food taboos in the belief that they are helping to ensure the health of their babies (Arzoaquoi et al., 2015).

These perceptions must be assessed within community health education in order to make it as effective as possible. Just as Lindenbaum discovered within the Fore in Papa New Guinea, there is not simply one way to implement new teachings to impact behaviors within anemia perception for a community. The Fore culture, based on cannibalism, were experiencing a type of neurological deficit due to this cultural practice. Instead of only teaching the fundamentals of the disease and trying to promote ways to change behavior, Lindenbaum studied the Fore and learned the meaning behind the cannibalistic rituals (Lindenbaum, 2013). This is an important aspect that I will be utilizing within my research project in order to produce a positive outcome. Arzoaquoi (2015) notes knowledge about the group that public educators are presenting to is vital for an initiative to succeed.

In order to conceptualize the effect that culture has on health and ideologies about healing, Iwelunmor (2015) provides the PEN-3 Model. According to Iwelunmor (2015) the three major domains f this PEN-3 Model are Cultural Identity, Relationships and Expectations, and Cultural Empowerment. The domain of Cultural identity includes people, especially those that are in close contact such as neighbors or family members. Relationship and Expectations consist of the influences that either encourage poor behavior or nurtures good behavior. Lastly, positive, existential, and negative aspects are a part of the Cultural Empowerment domain (Iwelunmor et al., 2015). Understanding the way in which a culture understands a concept affects the perception of health and the ways in which a group of people interact in their own medical realm. It is not necessarily a new concept that an educator or researcher from the outside of a people group will understand health behavior more by comprehending cultural context and eliciting the findings for further teaching, but it is vital to reiterate if for future reference (Iwelunmor et al., 2015). There is no single aspect of a culture that creates one single facilitator or barrier to a health outcome. From the level of social patriarchy and views of masculinity or feminism, down to the family unit and those who lives in one house, all aspects of Bolgatangan life influence the ways in which people view certain ailments such as iron-deficiency anemia. Without completely changing the culture that currently stands, it is crucial to note that researchers and educators need to elicit the positives of the cultural constructs in place while giving congruent education and reframe the perceptions of negativity within culture to improve health issues (Iwelunmor et al., 2015).

One major aspect of the Bolgatangan's women perception is their access to healthcare. There is literature on Ghana's insurance scheme and according to (Witter et al., 2009), the National Health Insurance Scheme of Ghana is primarily tax funded and has permitted an expansion of

coverage. However, the payments that the people of Ghana are making towards health insurance are not seen as sustainable because they pay a low rate and have no copays or "gatekeeping" system (Witter et al., 2009). Although many people are insured, it is unknown how much longer this system can thrive. From what was witnessed while in Ghana, the people pay 22-25 cedi, which is the equivalent to about four dollars, and purchase an insurance card and folder and that gives them access to the majority of their care. However, as noted within the results, there are instances in which they must pay extra for certain medications, birth control, or extensive care. This is yet another aspect that needs to be taken into account while educating this population.

This study's aim is to explore the perceptions of women in relation to nutrition and identify barriers and facilitators that impact their ability to provide adequate nutrition to prevent iron-deficiency anemia. This qualitative research of cultural competence is pertinent to the nursing field in that the field of medicine must begin to acknowledge that there are other forms of medicine that some communities use. The field must elicit that there are alterations that must be made to public health education for each community. Medicine is a cultural construct that is imbedded into the lives of each individual and is heavily influenced by the culture that they are surrounded by, and educators must adapt.

Methods

This study was predominantly qualitative in nature. Face-to-face individual interviews were conducted with 67 participants in Bolgatanga, Ghana over a period of three weeks in June 2018.

For the hemoglobin testing, we conducted three different days of trials in two separate clinics. People were given results and had the test done on a completely voluntary basis. Many people were very interested in getting their hemoglobin results. We utilized the EKF Diagnostics Diaspect TM hemoglobin testing machine in order to conduct the testing after being trained on it throughout our intersession course before arriving to Bolgatanga. This device was donated to this project in order to have a hand-held, easy to transport device for testing the hemoglobin levels of the women in Bolgatanga. An online training was completed before utilizing the device, and proper use was ensured by using aseptic technique. The finger was cleaned with an aseptic wipe, then pricked with a lancet that was then thrown into a sharps container. The blood tube was used to obtain the specimen, the tube was placed into the holder of the device, and the EKF Diagnostics Diaspect TM responded with the hemoglobin reading. The finger was wiped clean and bandaged after obtaining the specimen.

The tests were documented as they were taken and were plugged into a chart in order to visualize the results. Once the tests were taken, the women were given their results and taught a mini-lecture consisting of ways in which to prevent anemia if they claimed to have interest in learning, especially if they were below a 12 g/dL hemoglobin reading. The teaching was altered throughout our stay in order to be congruent with the taboos that were themes within the interviews.

The sample for this study consisted of 50 women of childbearing age in Bolgatanga, Ghana. I conducted 67 interviews throughout my stay in Bolgatanga and collected vast amounts of data. However, there were 11 interviews of women that were outside of the age range of 15-49 years of age and 6 interviews that were healthcare professionals. The answers documented from the town elders will not be incorporated into the results, but I consider them to be important to gauge the way perception has changed throughout the generations to the present. I chose to show respect to the elderly women that wanted to participate in the study, and I did not have the heart to tell them that they were outside of my research age range. Every woman interviewed waited in line with no expectation of a reward, and these older women deserved to be heard just as much as the ones within my age range. The remaining 7 interviews of the health care professionals were conducted to gauge their perspective on the issue of iron-deficiency anemia seen within the clinics.

A translator was used in order to ensure translation from English to the native language of the people in Bolgatanga is not skewed or misunderstood. Interviews were audio-recorded

and then later transcribed prior to analysis. Interview questions were phrased to suit the needs and education level of the people interviewed. The women interviewed were those attending the anemia education seminars, visiting the clinic for treatment, or women living within their homes in rural towns.

In order to refrain from coercion from women interviewing solely for the purpose of receiving something and wanting to please others, there was no gratuity given for participation in the interviews. I wanted the conversation to be as authentic as possible, and although they knew they were being tape-recorded, it was important that they spoke freely. Each woman was asked if they preferred *frafra* or English, and then I proceeded to ask them if it was acceptable if they were recorded. The questions were asked in roughly the same pattern for each interview depending on whether they were health professionals or the women themselves.

The questions that were asked to the women of childbearing age were:

- What is anemia (zim kazue) to you and what can happen if you have it?
- What is the cause of zim kazue?
- Is it important for you to avoid zim kazue?
- Have you ever been tested for anemia? Did you have it or not?
- If you were anemic, what did you/would you do for it?
- Do you have access to health care within your community?
- What are foods high in iron in your area?
- Do you have access to these foods? If not, why?
- Do you eat these foods when you have them? If not, why?
- Do you avoid certain foods during pregnancy? Are there any foods you avoid to protect your child or yourself during pregnancy?
- Can anemia be passed to a baby during pregnancy?
- What would anemia do to an infant?

Within the clinics I had nurses translate to the women that did not speak English, and I had my own translator for the women in the rural lands of the village.

Additionally, when I travelled to the various clinics and rural areas of Bolgatanga, I did not give gratuity to the women the day of the interviews. I waited until after all my interviews were completed in order to bring pieces of jewelry for the women who participated in the community for which they were very thankful. I wanted to wait until everything was finished to give gratuity in order to receive the most authentic answers with no other incentive other than them wanting to participate and share their views of anemia.

The questions that were asked to the health professionals were:

- How do you feel anemia affects the people of Bolgatanga?
- What are the ways you prevent/combat anemia in this clinic?
- Does everyone have access to this clinic? If not, who does have the access?
- How much cedi are appointments and/or treatment?
- Are the patients given education on how to prevent/combat anemia?
- What is your overall perception of anemia?
- Do you believe that resources are accessible to this community?

These questions were asked to the nurses, lab technicians, and public health educators to get a different perspective of how the health professionals thought their education and care was impacting the community. It is important to know whether or not the healthcare professionals find iron-deficiency anemia as having an impact on the community as well.

The translators on site were utilized consistently and understanding was always ensured throughout the interviews. A voice memo application on my phone was used to record the interviews.

This study was conducted following the approval by the University of Arkansas Institutional Review Board.

Results

There was a total of 65 tests at Clinic 1 and 111 tests at Clinic 2, over the course of three separate days. The patients were voluntarily receiving their hemoglobin scores. The Bolgatangan clinic's scale for anemia were hemoglobin levels that fall below 11.5 g/dL. The normal range according to the local clinics in Bolgatanga was 11.5-16 g/dL. The results are listed below. In the United States, healthcare professionals and the World Health Organization adhere to the scale of hemoglobin levels 12.0-15.5 g/dL as being an anemia diagnosis (Word Health Organization, 2011). This is slightly higher than the scale that the nurses and physicians are utilizing in Bolgatanga, Ghana. Of the 160 tests that were conducted, 45 percent of the women were within the WHO range for an anemia diagnosis. The results of the hemoglobin testing can be found in **Figure 1, Figure 2, and Figure 3.**

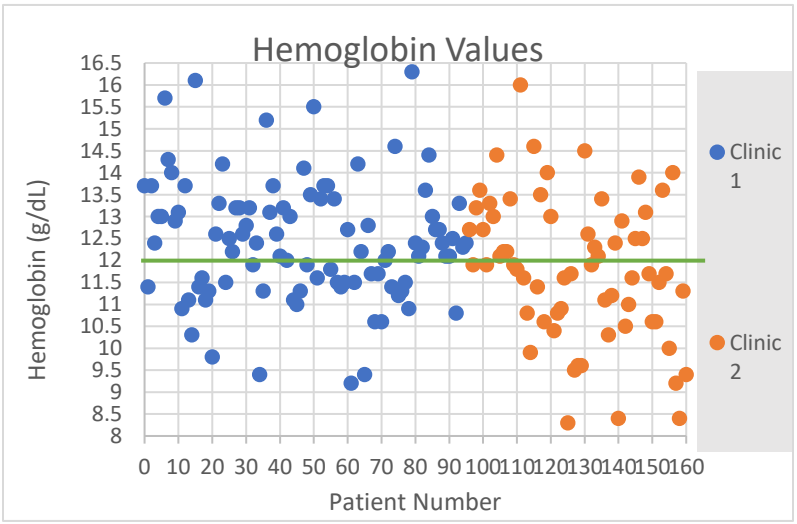

Figure 1. Scatter plot of results found within Clinic 1 and Clinic 2 with line indication of anemia diagnosis according to World Health Oganization's standards.

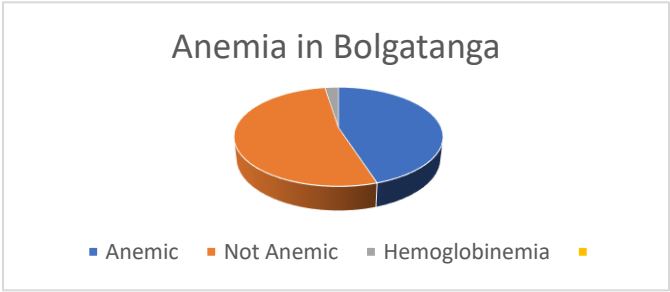

Figure 2. Pie chart showing hemoglobin testing results.

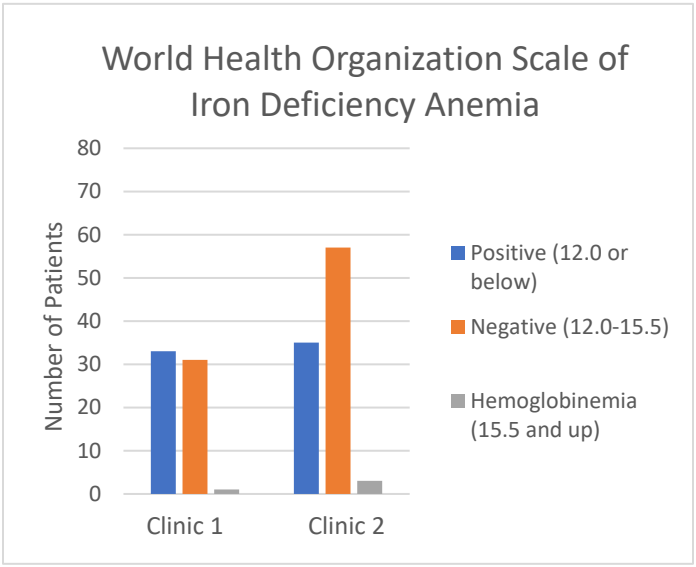

Figure 3. Histogram of the different hemoglobin levels between the two clinics.

A similar hemoglobin testing was done in Bolgatanga that focused on the density of anemia that showed women from rural areas were more prone to being anemic than urban areas (Ahenkorah et al., 2016). The locations in which I recorded the hemoglobin testing consisted of both rural and urban peoples that were able to get to the clinic that day. There was no indication of where they came from, as the clinics support people form the city as well as rural areas. The study above found that women had a decreased risk of anemia based on how many children they had. As a woman birthed more children, they less likely to be anemic (Ahenkorah et al., 2016). It was also found that there are many physical barriers to preventing anemia for women in Bolgatanga. Additionally, factors such as clean water source as

well as location of water and the presence of domesticated animals played a role in anemia rates (Ahenkorah et al., 2016). These are solely a few things that can contribute to anemia in Bolgatangan women that may seem outside of cultural practice, but in actuality they are all incorporated.

As for the qualitative portion of my research, I learned extensive amounts about the culture of northern Ghana through interviewing. Women came to interview consistently throughout the weeks that I conducted them, and the results were quite eye-opening to the reasoning behind the high amount of malnourishment and other disease processes that typically lead to iron-deficiency anemia among this population.

There were many themes within my research, and I came to find that there are many barriers as to why the Bolgatangan women suffer from iron-deficiency anemia in such vast amounts.

Perception of Anemia as a Disease Process

Zim Kazue

In *frafra,* the correlating concept of anemia is coined as the term *zim kazue (zeem-kah-zu-ay)* and refers to a "lack of blood" with *zim* meaning "lack of" and *kazue* meaning "blood". This is very important to understand before reading further as everything they explain refers to ways in which to regain blood volume and to replenish the blood that an ill person is missing when anemic. They do not think about anemia in terms of hemoglobin or red blood cells, but instead they see it as the body lacking blood volume altogether. However, they do get hemoglobin tests when they are first discovered to be pregnant and are aware that this is a test tied to an anemia diagnosis in the clinics they attend. Nearly every interviewee claimed that the way to treat *zim kazue* was to implement care that "gives you blood", and that they view certain foods, treatments, and medications as having the ability to do that. All the women that were interviewed spoke of *zim kazue* as being a serious compromise to health, and that they always strive to avoid it except for one woman interviewed.

According to the few health professionals that I interviewed, they feel that anemia affects the people of Bolgatanga greatly, especially pregnant women. Pregnancy naturally can bring anemia, but it is prevalent in women that are not pregnant as well. Anemia should be treated in every patient and should still be avoided whether a patient is pregnant or not.

Cause

All the women that were interviewed, whether it be in the rural villages or the clinics, claimed that malnourishment was the major cause of *zim kazue*. In Western medicine, iron-deficiency anemia is considered a factor of many aspects of health, but for this specific group of people it is correlated mainly with diet.

Within this community, food can either give a person blood or not. Causes of anemia that were mentioned were:

- Not having enough blood was the overall theme of cause in the interviews.
- Not taking in foods that give a person blood was the leading cause for shortness of blood supply.
- Anemia is caused by not eating well, loss of appetite, and malnourishment or starvation.
- Eating food that is lacking in protein was considered a cause of iron-deficiency anemia.
- A lack of iron was a cause of anemia that was mentioned in a few interviews.
- Anemia could be caused by a sickness that is inside of a woman.
- It can be caused by the blood clotting too much.
- One woman mentioned extensive loss of blood can cause anemia.
- Not consuming enough spices or meat can cause anemia.
- Taking in cold foods could cause a lack of blood.
- Not eating fruits and vegetables, such as beans, can cause *zim kazue.*
- If a woman's blood is draining and she has been working outside and not eating enough, this could cause anemia.

- If one takes in a lot of oil foods or only spiced foods with salt, they will lack blood.
- One woman claimed that it could be caused by mosquito bites and taking in too much alcohol.
- Some women explained that anemia was caused by a low "HB", meaning hemoglobin,
- One woman stated that anemia can be caused by the blood clotting.
- A nursing student claimed that the cause of anemia could be infection, maybe infestation, disease, and not eating well.

Symptoms

Throughout the interviewing process there were various ways in which the women explained they knew if someone was experiencing iron-deficiency anemia. There was a wide range of clinical manifestations and below are the recorded symptoms of iron-deficiency anemia from the various women:

- Low blood level
- Dizziness
- Weakness
- Loss of Pregnancy
- Premature Birth
- Stillbirth
- Loss of Appetite
- Draining Blood
- Very pale with a pale sclera below the eyelid
- White palms
- Difficulty Breathing
- Vomiting
- Headache
- Abdominal Pains
- Uneasiness or Anxiety
- Death

Treatment

Foods and Diet- Nearly every woman interviewed claimed that anemia was a result of poor diet, malnourishment, or starvation. Therefore, most women claimed that in order to combat anemia or prevent it altogether, they would eat healthier and consume foods higher in iron. Below are the foods that were mentioned throughout the interviews and the ways in which they were perceived.

Blood Tonic/Iron Supplements- Five women responded that their treatment option was taking medication, blood tonic, or iron supplements to give them blood. This was supposed to complement a change in diet. Ferrofix and ferrous sulfate were popular supplements that I witnessed being prescribed to women diagnosed with anemia at the clinics.

Physician Visit- Seven women claimed that they would go to the hospital and see a physician if they thought they were anemic and lacking blood. This is a very small population of 14 percent of the women interviewed within the childbearing age group. Of these women, the majority of them claimed they would also change their diets to give themselves more blood.

Pregnancy

Every woman was asked whether or not anemia could affect a child during pregnancy if they were anemic during any point of their gestation. There were 7 women that did not think that anemia could affect a child if the mother had low hemoglobin levels. Many of these 7 women perceived it as impossible because if the woman herself did not have enough blood, there was no way she could cause the baby to not have enough blood. Four women said that it was possible to affect a child sometimes. Three women did not know whether it affected a child or not. One woman claimed that an anemic mother could have complications to the fetus, but that she did not think that the complications would be serious. The other 35 women interviewed claimed that anemia during pregnancy would affect the fetus during gestation.

Infancy

The majority of the women claimed that *zim kazue* had negative effects on children. Symptoms and care techniques of anemia in a child born anemic or a child that developed anemia in early stages of life had a large range between the interviewed women. Themes within the interviews were that:

- An anemic infant would be pale, and the sclera would be very white.

- The child would experience inactivity, fatigue, swollen feet, weakness, hyperventilation, weight loss, and will have a low blood level.
- Stunted growth could result from a child being anemic. One woman claimed that a child with anemia would never increase in size if the child was diagnosed with anemia.
- Anemia in a pregnant mother could cause the loss of the baby, especially if the symptoms are not caught quickly and if it went untreated.
- Some women indicated that the child needed to take in nutrients if he/she is anemic as they are malnourished. If the woman is pregnant, she also needs to take in food that will give her blood.
- Some women claimed that it could cause premature delivery. In this case, the mother is in danger as well. Some women claimed if a baby is coming that is suspected to be affected by anemia, the woman must go to the hospital for the birth. One woman claimed the child may be a stillborn if it is affected by anemia.
- Some women claimed that the stomach of the child would swell. This could be related to the distention of stomachs, kwashiorkor, when a child is malnourished for an extended amount of time.

Some women claimed home health ways in order to care for a child with anemia, while others claimed that they would take the child straight to the hospital for check-ups if anemia was suspected. For the women that believed that anemia could affect a child during pregnancy, they had very similar insights to the symptoms of childhood and infant anemia as in Western medicine.

Perception of diet

Foods

The trends in food varied drastically as to what the women believed combatted and prevented their cultural ideology of anemia. The foods that they listed were typically foods that they believed would give them "more blood" and to help fight off this symptomatic issue of underlying disease and larger problems.

The major foods that were listed as helping with anemia were the following:

Bitoh Leaf- This food is a dark, leafy, green vegetable that many of the women interviewed claimed to be able to give blood. It was said that it is added in teas, soups, and various dishes in order to enhance the food's nutrients.

Bam Boua (Bambara) Beans and Red Beans- These were mentioned in many interviews as giving a woman blood to prevent or combat anemia. These beans were found at market in large piles and were seemingly plentiful in the area.

Red Corn- Many of the elderly women interviewed outside of the age range of bearing children claimed that red corn was a vital source of iron. When they felt anemic, they claimed that red corn is always what they ate after working out in the fields. Some of the younger women mentioned it as well, but it was mostly a theme in the elderly.

Baobab Fruit/Leaves- Although this was a taboo for some women, this was noted as a source of

iron as well. In Bolgatanga, there are baobab and mango bars that are pre-packaged and are very popular.

Meat- Some women claimed that meat was a good source that is high in iron and could give a woman more blood.

T-Z (tee-zit)- Although there were extensive taboos tied to this food, it was also noted as something that could give a woman blood. It is a grainy substance that is typically served with a red sauce. This food is made with millet and contains a high amount of iron. T-Z could be an alternative in teaching methods on iron sources available to this community.

Fish- Aside from *mudfish* being a taboo listed, it was noted as a source of blood in many interviews.

Eggs- This specific food had quite a few taboos attached to it, but it was also noted as a means to obtain more blood.

Green, Leafy Vegetables-Many of the women claimed that eating vegetables, especially dark, green vegetable would help give blood. One woman claimed that she grinds up her vegetables and bitoh and mixes it with milk to give her blood.

Tomato Paste with Malt- This was noted as something that could give blood, especially in the elderly population outside of the testing range.

Groundnut soup (peanut soup)-The women pronounce it "granite soup" and it is a traditional Ghanaian dish that is believed to be high in iron. This dish is typically made with bitoh leaf as well.

Milo- One woman claimed that if she was anemic, she would take Milo which is a popular energy drink. This drink contains cocoa which adds to the caffeine.

These are cultural foods that are local to the community, however they are not always financially accessible. These women could go to the markets, but they may not be able to afford these foods that reside there. Many women claimed that they would eat them if they had them, but they were simply too expensive for them to purchase.

Cultural Taboos

Every culture has certain ideologies that originate from generational teachings and experiences that a people group has throughout their lives. Bolgatanga is not an exception to this trend. Due to their insistence that the root cause of anemia is malnourishment, the interviews were tailored to elicit which foods were facilitators and/or barriers in the cause or prevention of anemia. I asked every woman interviewed if they avoid certain foods during pregnancy and these are the results that were discovered:

Eggs- When a woman is pregnant, it was a common theme that they do not take in egg. One taboo that the women had about eggs is it would cause the child to be born with a bald head. Another taboo correlated with the consumption of egg is the child being born and becoming a thief or someone that is known to steal frequently. Another woman claimed that eggs would cause the child to spoil. It was also said that eating egg during pregnancy could cause the fetus to be enlarged.

Banana- If a woman ate banana it was perceived to cause a sickness in the middle of the head of the child. The woman interviewed referred to it as *zulika or azrun*. The baby will not grow well, and there will be a seed at the stomach of the baby.

Mango- If a woman consumes a copious amount of mango the child may have stomach disturbances and will release flatulence and suffer before they eat with stomach pains.

Honey- One woman claimed that she believed that honey could cause miscarriages and that it is not good for children during pregnancy.

Bam Boua Beans- Beans can cause dizziness and one woman said that she ate them, felt feint, and then did not eat them during her pregnancy again. The same woman claimed that leaves made her feel dizzy. She claimed Bam Boua beans were not eaten during pregnancy as some women thought that they would cause the placenta to have difficulty coming out during birth.

Baobab fruit- The sourness of the baobab fruit is thought to make the infant wrinkled. Women stop eating baobab when they get closer to birth.

Another woman claimed that this fruit would cause the child to be constantly ill after being born.

Fish-Consuming fish during pregnancy is believed to cause sickness for a child at birth. The women claimed the center of the child's head, the fontanelle, will be pulsating in and out on the skull. It is a fish called *mudfish* that can be found at the local market that particularly is thought to cause this symptom.

Guinea Foul- Many women do not take in guinea fowl because they believe that the child that is born will become a thief. The husband will take it, but the women will not.

Chicken- Chicken was claimed to be thought of as something that also would cause a child to be a thief if consumed during pregnancy.

Crocodile- If crocodile is eaten while pregnant, the child will not grow well inside of the woman. This consumption could also lead to death of the child.

T-Z- T-Z (*tee-zit*) A mushy grain that is used in many traditional Ghanaian dishes in Bolgatanga. There were specific taboos attached to T-Z, especially T-Z that sticks to a pot after making and serving it. It is said that if you take T-Z that has been sitting out, it will cause frequent stools in the mother and the child will be sickly. Another woman claimed that if you tear the T-Z and consume it that it will cause the placenta to burst during birth, and the child may die.

Rice- Rice was considered in the same realm as T-Z above in that it could harm the child if it was consumed after it had sat out.

Sugary Foods- The women in the rural areas of Bolgatanga consistently told me that foods that are high in sugar should not be taken when pregnant, because it will cause a sore to be on the anus of the child when it is born. They say that it is acceptable to consume foods that have sugar in moderation, but it is important not to consume an excessive amount. Another woman claimed that sugary foods would cause the mother to not have enough blood, which will negatively affect the child within her. It was said that sugary foods can disrupt the child's naval system, and that the child will "not be free", which translates to the child suffering. The child could consistently have an upset stomach as well due to a mother taking in sugary foods during pregnancy. This could also cause the child's growth to be stunted inside the womb.

Cold Foods- The resounding answer for this taboo is that cold foods can harm a child while a woman is pregnant if eaten. It correlates with the fact that food that has been sitting out for long periods of time is most likely unsafe to be eating as it may be unsanitary. This is something that has been told by the nurses as a precautionary sentiment. Cold food was also said to cause sores on the anus of the infant when it is born. The child after birth will always be scratching and itchy around the anus sore. The women also claimed that it would cause the child to not grow well throughout periods of gestation. Food that has been left out for an extended period of time and then consumed can also cause a woman to feel that she is going to give birth when she is not in labor. One woman claimed that cold foods could lead to death of the child.

Uncooked or Raw Foods-If a woman takes in raw or uncooked food then it will feel like she is giving birth when she is not in labor. This could also be a sanitation precaution due to the fact that many people in Ghana do not have clean running water, therefore if it is not cooked or boiled well there is a higher chance of contamination.

Chilled Water- Cold water is never to be consumed during birth, because it is perceived to cause a lot bleeding at birth.

Islamic Religion- In Islamic communities of Ghana, women follow the practice of not consuming pork or pig products.

Covering of Breast: One woman noted that it is imperative to keep their breasts covered, for if she would expose them, there could be problems with the baby. This was mentioned in only one interview, and it is a bit contradictory as most women seen in Bolgatanga openly breast fed.

Kahika (kuh-hee-kuh) - This food is forbidden to take during pregnancy, but it depends on the pregnancy. This was mentioned but was unable to be found in literature.

The Elderly Women- The older women that were interviewed but were outside of the child-bearing age range had some insightful input that impacts the data I was collecting. The older women talked of how the system has changed and that the younger generations do not follow the taboos as strictly as they did. The older women consistently brought up that they should consume red corn, or *molaka (mow-lah-kuh),* while they were pregnant. They also mentioned they did not take in cold foods just as the younger women mentioned. T-Z that stuck to the pot after preparing it was not consumed as it was thought to cause expansion of the woman's legs and may cause death to the child in the womb.

Many women commented on food items that caused them to feel ill and were not necessarily tied with cultural taboos. These foods included pepper and salt, spicy foods, fried rice, oily foods, *salt peta (pee-tah)*, groundnut soup, porridge, and green leaves.

I also found that the women of Bolgatanga are well-educated on the fact that one should not smoke or drink alcoholic beverages while pregnant, as that was an answer some women gave when asked this question.

Perception of access

Socioeconomic Reality

It is not a new concept to understand that socioeconomic status plays a large role in health and access to the resources needed to nourish a body. It is also not a new realization that many women in Bolgatanga earn very little if anything at all. It remains a patriarchal society in which men are given much more opportunity and women are left at home, many times without money or education.

Many of the women that I interviewed perceived the reasoning behind iron-deficiency anemia as being malnutrition. There were varying ideas about the foods that should be eaten, but almost all the women said that they were expensive, and they did not have the means to obtain the food. Some mentioned that the food that was affordable was not always available or in-season. I validated this information by clarifying with the question "If you had access to the foods you listed, would you eat these foods in your household?", and the answer was always a resounding yes. However, the expense that these women had in order to obtain these foods is certainly a very large barrier, obstructing a path to nutritious consumption of iron-rich foods. Although the knowledge was there, they may have not had what they needed to buy it once they were there.

However, my interview with the public health nurse proved that she was skeptical of this answer as she found that many women do not prioritize their money. The women typically buy the foods that may taste better but may be low in nutrient content. The public health nurse claimed that although the women are well-educated on what foods are rich in iron, they may not buy them solely because they do not taste as good and they do not want to spend their money on these items. She claimed that she did not find many of the foods listed to be expensive. These concepts are important to keep in mind as teaching is conducted in the future.

Transportation

Transportation was quite prevalent throughout the city, and consisted primarily of taxis, motorcycles, bicycles, and mid-size vehicles. Taxis are fairly cheap in regards to the economic climate in Bolgatanga, and many people of both sexes were seen frequenting them throughout my stay. Cars were scarce, but there were plenty of other ways to get around.

Few women claimed that they struggled to find transportation, and they seemed to always know how to get where they needed to go. I did not discern from my interviews that transportation was an issue for the majority of the women I interviewed whether it was in the rural areas or within the clinical setting. The healthcare professionals claimed that they believed that transportation was quite accessible in order to arrive to a clinic for women in Bolgatanga, and they did not deem it to be a barrier to care either. Also, many people walk to wherever they are trying to go.

Education

Education has a major role in healthcare and is easily overlooked. Luckily, in Bolgatanga the

clinics are adamant about providing public health teachings to the women that visit the maternity ward. Every morning and throughout the day, the nurses admitted to doing a short presentation on health risks during pregnancy to ensure that all women are aware of when to come see a physician. This optimizes the well-being of the women and their growing infants. The women listened intently every morning I was there as they went through the various complications and reasons for coming into the clinic, and anemia was one of the complications. The pamphlet that they used to facilitate their teachings consisted of diagrams and information about the following: headaches, bleeding, abdominal pains, swelling, excessive vomiting, and anemia. These were all the symptoms of pregnancy complications that the clinic taught every morning as warning signs and a need to come to the clinic to get professional assistance. As seen in **Figure 4, t**he chart diagram depicts anemia as a woman having her bottom eyelid pulled down and a health professional looking at the white of her eyes below the lid. This was a common practice that I saw done to make a case for a potential anemia diagnosis and a reason for hemoglobin testing outside of pregnancy.

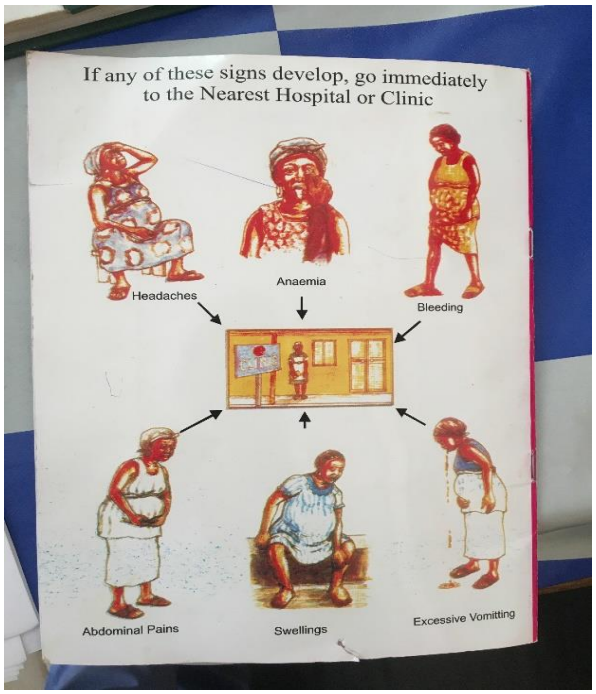

Figure 4. Photograph of pamphlet on anemia given to the women within the maternity clinic.

Every woman is given a folder upon their first visit to the maternity clinic and this is what is utilized by healthcare professionals to distribute educational bulletins and to document care. These folders are essentially their tracking system, and the women take these folders home and bring them with them for every visit.

The majority of the women knew what anemia was within their own cultural perception and had a lot to say on the subject. Most of this education is stemming from the clinics they attend, and this proves to be a beneficial system of providing the public with health information.

Health Insurance and Clinic Access

Of the women interviewed, three of the women claimed that they did not have access to a clinic. Only two of the women interviewed about health insurance claimed that they did not have it, and one woman claimed that she did have insurance, but she let it expire and could not afford to renew it. The way in which health insurance functions in Bolgatanga is a woman will go to a clinic for an appointment walk-in, get a number, wait until they are called into their respected unit, and in order to receive treatment or obtain prescriptions they pay an approximate 22-25 cedi amount for an annual health insurance card and folder. This card and folder will help lower the cost if not deplete the costs of any care that they may receive. If they do not pay the annual 22-25 cedi in order to receive health insurance, treatment can be quite expensive, especially for Bolgatangan women. The clinics that I frequented had insurance quite accessible to all of their patients, and the women did not find the process of obtaining insurance to be difficult.

The nurses, lab technician, and public health representative that I spoke with claimed that care at the clinic that they represented was very accessible to the women of Bolgatanga, and that care was not out of a realistic price range. Nearly every female healthcare professional commented that the clinic gives iron supplements, blood transfusions, and hemoglobin testing to those that are deemed candidates for anemia treatment.

Of the women that were interviewed, 14 percent claimed that if they suspected that they had *zim kazue,* or tested positive with a hemoglobin test, that they would go the clinic and see a physician. 76 percent of them said that they would attempt

to self-heal before going to a clinic if they suspected they had fallen ill with anemia.

Out of the 50 women that were within the age range and were interviewed, only 16 percent of the women had been tested for anemia in the past. Of the women tested, 16 percent were positive for anemia. The clinics that I conducted a portion of my interviews in had mandatory hemoglobin testing for women that were pregnant, and since most of the women within the study's age range had had a child already, they were tested if they attended a clinic at any point throughout their gestation.

Discussion

Within these findings, it is important to note the many cultural indicators that could cause women of childbearing age to be more susceptible to having anemia in Bolgatanga. There are various taboos that have filtered down from generation to generation that contribute to the low hemoglobin levels throughout this age group.

The results were unexpected as I did not have any idea of what I would find in northern Ghana. There is little to no literature on the subject I studied in this region. There are some papers written about southern Ghana, but the cultures differ in many ways. I conducted this research as an explorative study and was open to any findings throughout my interviewing process. I did, however, hypothesize that there would be certain taboos that would interfere with their maternity health which was found to be accurate.

As within my previous research, there are many aspects that flow into the outcome of health, and it is vital to understand the complexity of this construct. Culture has a profound impact on how a population interprets medical care and illness, and Bolgatanga has many parts of their society that prove this to be true.

The hemoglobin testing was done in order to portray and solidify the proof that anemia is prevalent amongst this population. Out of the 160 women of child-bearing age that were tested, 72 would be diagnosed with anemia by the Mayo Clinic standards. Forty-five percent of the women tested had anemia. This finding proves that anemia is quite prevalent in this area. Also, as noted above, this study was conducted during the malaria season and this could have contributed to the high rate of low hemoglobin cases.

The interviews were conducted throughout the month I resided in Ghana in order to organically obtain information about the Bolgatangan women's view on anemia. It is important to ask well-rounded questions that encompass the many layers to the ideology of anemia within the community. It was important to understand and interpret how they thought it affected them personally, how they knew if they had it, if they thought it was something they should receive care for, and how they would go about treatment. Then, I moved on to the type of care they received, what the treatment relieved and how, and if they would seek professional medical care in the sense of a Western clinic. Afterwards, I found it to be important to note whether or not the women felt that they had access to either the home remedy routines they used or to clinical care. I wanted to know all aspects of their access and the facilitators and barriers to that care that they saw in their daily lives. I then wanted to specifically find how they thought pregnancy played a role in anemia, if they believed that anemia could affect the child growing within them, and what clinical manifestations a child or infant would portray if they had anemia. The women were very open to my questions and gave answers with insight and reasoning behind every word.

As a public health educator, it would be important to note that the people of northern Ghana believe that anemia is a lack of blood. This very foundation of ideology around the process of anemia is vital to incorporate into teaching. It is also important to note that all of the women interviewed perceived anemia as being a health issue due to an imbalance of diet. As an educator, it would be helpful to include other means in which anemia can be caused so that the women are aware, but to mainly focus on the food groups that are going to provide them with iron. However, the teachings by future public health educators should be aware of the cultural food taboos that this community holds and tailor that teaching to what has been learned throughout this study.

The negative cultural food taboos such as eggs, beans, meat, T-Z, baobab, chicken, guinea fowl, and fish could all contribute to this high percentage of anemia prevalence in Bolgatanga. It is imperative that when educating that these are avoided as the sole iron sources and that other options are provided as sources of iron. It should be mentioned that these taboo foods can give iron, but it is imperative to note that if they are not comfortable eating them that there are many other options and refrain from making that the focus. If an educator disregards these taboos and teaches strictly from a Western perspective, then the audience will not be reached effectively.

Within the foods that were mentioned by the women as giving blood, some stood out. It is quite possible that the tomato paste and the red corn could be perceived as giving blood solely for its color. In the Western community we do not think of corn as being rich in iron. Although, it is possible that the way in which the red corn is cultivated and grown in Ghana does give it some other supplements that I am unaware of. Tomatoes can be a source of iron, but it may also be that the red color is correlated visually with giving blood to a woman with *zim kazue.*

A potential reasoning behind the ideology of the baby becoming a thief due to a pregnant woman consuming meat or eggs during its gestation may stem from the fact that these items are expensive. According to a local, John Agana, this perception is influenced by the thought that if a woman or child was seen eating these items then it was likely stolen since very few people could afford them. This goes for many taboos, as every single one of them has a reasoning behind them. No culture creates a construct or ideology without meaning or history of generations passing down the information. There was most likely a person in the past that had this specific situation happen to them and it began this specific taboo.

In retrospect, the access to the foods that the Bolgatangan women believe will give them blood is low. Very few women claimed to have enough financial means to buy the foods that they noted were rich in iron. However, as stated above, upon talking with a public health representative at a clinic in Ghana, she claimed that if the women have the money for it, they may not be buying it simply because these foods do not taste as good as other options. She claimed that there are certain foods in which they know are good for them, but they would prefer others and simply claim to not be able to afford them. This is true in places all over the world as well, especially within the United States.

Overall, it is a positive outlook on the community's health initiatives to know that the neighboring clinics are engaging these at-risk women in education about anemia to provide awareness of the process. It is important to note that nearly all the women interviewed were concerned about iron-deficiency anemia and wanted to avoid it in the ways in which they were educated. Whether the information was provided by their health professionals or the people within their communities, all the information gained was valid. After interviews, the women were all receptive of the teaching that I gave, and I learned a lot from them. I made sure that my teaching did not interfere with the information on taboos that were collected, and the women were grateful.

Limitations to the Study

Within this study there are certainly flawed aspects. The fact that the study was conducted over a mere month is a flaw alone. Had I had more time, I think that I could have managed to gather enough data for a more uniform, concise result. There is no way to compartmentalize a culture by only interviewing 67 people. I do not claim that this is a comprehensive study and a final conclusion, but it certainly is a start into the realm of public health initiatives for an at-risk population in this specific community.

The fact that the study was limited to the two clinics and one rural town is also a limitation to this study. Had there been more time within the program and had there been more freedom of location and movement throughout the month that I resided in Ghana, I certainly could have given more data and collected more comprehensive results. Additionally, the women were all together when they were being interviewed and some of their information was potentially retrieved from previous interviews. The women also felt the need to adhere to what

the other women in line were saying, and some seemed to feel ashamed to share cultural beliefs.

Lastly, there was very little literature on the community to begin with. Therefore, the questions in the interviews had to be tailored throughout the process in order to collect accurate data that was pertinent to the community's ideologies and culture. It was difficult to adjust when there was no prior information of this subject.

Conclusion

Within this study, I learned that within every community there is something to learn from the people. The depths of a culture are bottomless, and I have simply scratched the surface of Bolgatanga. If one thing is taken away from this study, I hope that it is to ask the people before you speak. Public health initiatives cannot be done effectively without understanding the culture and the people before you in the audience. It is imperative that everyone do their part and to meet the audience's needs in order to get the best results and portray the information in an effective manner. This certainly is not a new concept, but it is one that seems to be consistently forgotten. Just by going and asking the women around me, I learned a plethora of information. The very idea of anemia is different from my own in this community, therefore I need to know every other aspect that is different so that I may execute my presentations in a way in which the women will receive. I hope that these women can look at this study and feel that they are represented well and that their culture is represented accurately.

In conclusion, the women of Bolgatanga know about anemia, know that it is something that is not found in healthy people, and, for the most part, have a means to treat it. Although the ideology is different, the need for care remains the same. They are aware that this is a process of ailments and that it must be stopped. It is the duty of the public health educator to bridge the gap between the two visions and give the best care possible in order to help this community in need.

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