

Assessment of Hypertension and Asthma Data Collected in a Health Clinic in Rural Jamaica

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ABSTRACT

The objective of this study was to analyze health data collected from three annual service-learning programs to Jamaica to better determine the current health status of the population and assess the prevalence of diseases within the community. A group of Lock Haven University Physician Assistant Program students traveled to Harmons, Jamaica to work in a rural clinic to obtain basic patient information and vitals as well as treat any found illnesses and injuries. The patient data that was collected was used to characterize the population's major health concerns and most prevalent diseases within Harmons. Hypertension, asthma, and body mass index (BMI) were examined. Jamaica's population was found to have 25% prevalence of hypertension (Ferguson et al. 2017). BMI statistics show a significant increase in the data specifically for women for the 25 kg/m² and 30 kg/m² classifications (NCD Risk Factor Collaboration (NCD-RisC), 2019). Based on the standards provided by World Health Organization (WHO) and the American Heart Association (AHA), the community faces high rates of obesity and hypertension as well as a high asthma rate. It is hypothesized that the disease prevalence for asthma is related to Bauxite mining, whereas diet and activity level are correlated to hypertension. This study found 88 patients to have hypertension for the three-year span, which makes a 23% prevalence rate. Over the three-year span, there was asthma prevalence rate of 19%, which was from 73 patients. High BMI may be attributed to the poor health status in Harmons and reflects the major health concerns of hypertension and asthma..

Keywords: asthma; bauxite; clinic; body mass index; prevalence;

Jamaica is a Caribbean island that is located south of Cuba which has a population of approximately 2.5 million people and is equally divided between urban and rural dwellers ("The World Factbook – CIA", 2017; "Jamaicans – Introduction ...", 2017). Jamaica is divided into fourteen parishes. In the parish of Manchester on the Southwestern part of the island is a very small village called Harmons ("Parish Profiles - Jamaica Information Service", 2017).

Working through a nonprofit mission organization, Lock Haven University (LHU) faculty and students provided health services for the Harmons community from 2015-2017. The LHU team worked out of a local clinic performing physical exams and taking patient medical histories. A majority of

faculty and students either were or are becoming Physician Assistants.

The objectives of this project were as follows: 1) organize the health data collected from the LHU clinic in Harmons, Jamaica over a three-year span; 2) analyze the data to determine the prevalent health concerns for the community of Harmons; 3) use BMI to categorize the percentage of the population that is undernourished or overweight; 4) use the data to develop strategies for enhancing the medical interventions used to support health care initiatives in the community of Harmons, Jamaica.

METHODS

The project was approved by the Institutional Review Board (IRB) for the use of human subjects at Lock Haven

University. Participants gave informed consent through the process of voluntary participation in the clinic. The data used in this study were collected during a week-long service-learning program to Harmons, Jamaica over three consecutive years (2015, 2016, 2017). Data were collected during patient visits to a clinic run by LHU for a total of 387 participants in the three years.

The patients were asked questions related to their past medical history, their family's past medical history, sexual activity, medications use, and known allergies. An LHU team member was then responsible for measuring blood pressure, height, weight, and in some cases pulse. Over the three- year time frame, women consisted of (60%) of the patients at the clinic and the men made up over a quarter (30%) of the patients. The sex of the remaining patients were unreported and accounted for ten percent of the study group. The age distribution for the study uncovered a majority of the patients being within the ages from <1 to 40 years old (64%).

Each patient's blood pressure was taken with a standard blood pressure cuff and was classified using the guidelines from the AHA. Normal blood pressure is defined as less than 120 mmHg systolic and less than 80 mmHg diastolic. Pre-hypertensive blood pressure is defined as 120 to 129 mmHg systolic and less than 80 mmHg diastolic. Stage 1 Hypertension is classified as 130 to 139 mmHg systolic and 80-89 mmHg diastolic, and Stage 2 Hypertension consists of greater than or equal to 140 mmHg systolic and greater than or equal to 90 mmHg diastolic. Lastly, a Hypertensive crisis is when a patient has a blood pressure of greater than 180 mmHg systolic and greater than 120 mmHg diastolic (AHA, 2017).

The patient's height and weight were recorded to determine Body Mass Index (BMI). The BMI classifications were compared to those from the World Health Organization (WHO) international guidelines for body mass index. Underweight is considered less 18.5 kg/m², normal healthy weight is considered being between or equal to 18.5 and 24.9 kg/m². The classification of overweight is being between or equal to 25 and 29.9 kg/m² and the obese category is equal to or over 30 kg/m² (WHO, 2017).

RESULTS

In 2015, the number of patients seen at the clinic run by the LHU team was 95. The number had a slight increase in 2016, with a total number of patients attending the clinic being 107. The clinic for the year of 2017 led to a substantial increase, having 185 patients, which is approximately double the number of patients for 2015. The patient assessment category was used to portray the number of patients that the PA students diagnosed at the clinic. However, the past medical history and the family history categories refer to the patient's report of having the disease or someone in the family having the disease.

Table 1 shows the percentages of the patients with the listed diagnoses from all three years combined. The data was collected from only the patient assessments as well as the patient's past medical history so that it represented just the patient themselves and not a family history of the disease. The Body Mass Index (BMI) was used to compare the weight classification (Figure 1) according to the World Health Organization guidelines for BMI. The data reveal a high incidence of obesity, especially in the case of women.

Table 1: Percentages of patient diagnosis reports for the three-year span (HTN = hypertension)

Patient diagnosis	Number of Patients over 3 years	Test Population Incidence
HTN	88	23%
Asthma	73	19%

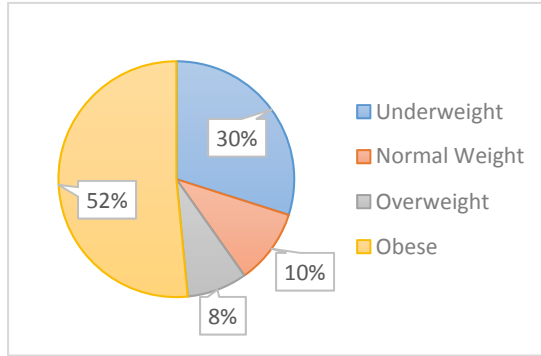


Figure 1: BMI for men and women of the three-year span

The systolic blood pressure was used to categorize participants based on the level of hypertension from patient assessments. Figure 2 shows the blood pressure classifications for the study group. Aside from the unreported (26%), the majority of the patients fell within the pre-hypertensive to hypertensive crisis ranges and accounted for approximately 51% of the clinic’s patients. This leaves only a small percentage (23%) of the study group representing a normal blood pressure.

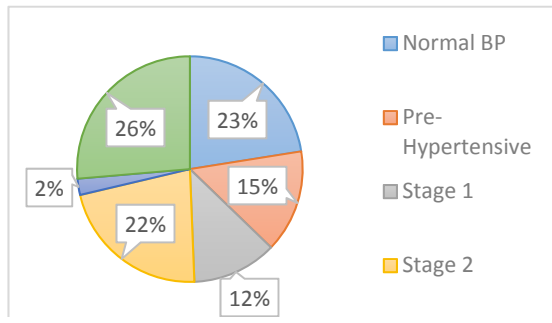


Figure 2: Blood pressure categorization of the study patients

Table 2 depicts the cases of hypertension for each year based on the systolic blood pressure measurement.

Table 3 displays the prevalence of asthma in the individual years by reported sex, which was collected in the patients’ assessment results. Figure 3 shows the change in diagnosis percentage for each year for hypertension and asthma. Figure 4 identifies the health topics for which the Jamaicans would like to receive education.

Table 2: Hypertension prevalence, based on systolic pressure, by year and reported sex

YEAR	SEX			Total
	F	M	Unspecified	
2015	41	12	2	55
2016	36	18	2	56
2017	52	25	6	83
TOTAL	129	55	10	194

Table 3: Cases of Asthma based on the Patients’ Assessment of the Three Years for each Gender

YEAR	SEX			Total
	F	M	Unspecified	
2015	0	1	0	1
2016	4	4	0	8
2017	3	3	1	7
TOTAL	7	8	1	16

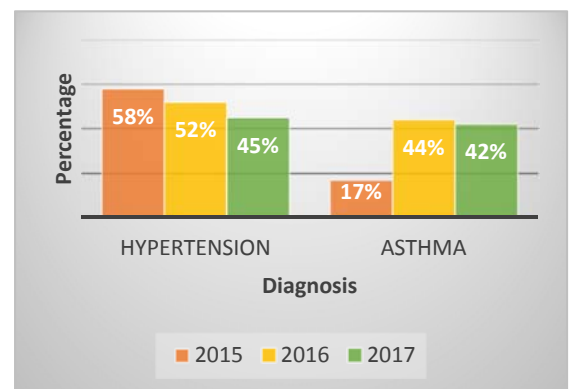


Figure 3: Prevalence (%) of hypertension and asthma diagnoses for each year

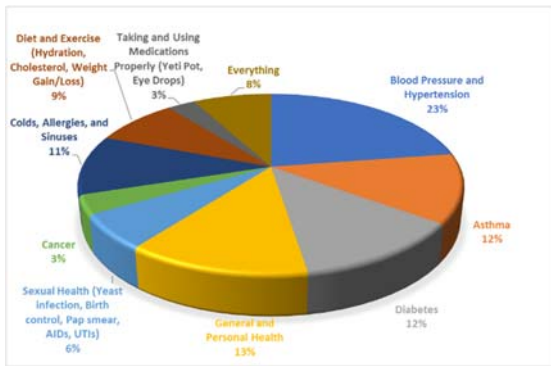


Figure 4: Major health topics for further LHU team research opportunities

DISCUSSION

After evaluating the data collected for the research study, many interesting findings were observed for the three-year span. First, the number of patients that attended the clinic each year increased, possibly due to their interest in medical treatment as well as the education learned from the LHU team. Females represented the majority (60%) of patients seen at the clinic. Males made up less than half (30%) of the patients and a tenth (10%) of the patients were listed as unreported in regard to sex.

The age distribution of the study revealed that the majority of the patients were under the age of 20 (150). The ages from 21 to 40 years old were the second highest number of patients (95) at the clinic and the third leading age category was from 41 to 60 years old (80). Based on the study results, the women tend to have more availability to attend the clinic. This is likely due to the men being off working and unable to make an appearance at the clinic while the women would go to the clinic and bring the kids as well. The clinic was offered during the middle of the day between the hours of 8 am and 4 pm, which can be a limiting factor in representation of the community's health due to the clinic being held during working hours.

The data were used to calculate percentages for the medical conditions. Hypertension had the highest incidence reported during 2015 (21%) and decreased significantly in 2016 (7.4%). At the end of the three-year span, hypertension percentages dropped further in 2017 (6.3%). For the three-year span, eighty-eight patients were classified as having hypertensive characteristics, making up over a fifth (23%) of the community that attended the clinic in the three years.

Dalip et al (2002) reported that 30.8% of Jamaicans in their study, age fifteen or older had hypertension. The prevalence of hypertension (22.7%) identified in this study approximates that reported by Dalip et al (2002). While the sample size in their study was larger, this study showed similar trends for hypertension in the community of Harmons.

In 2015, 19% of the ninety-five patients were treated for asthma. This decreased to 3.8% in 2016. The percentage in 2017 was the highest value for asthma in the three individual years (20%). Overall, patients affected by asthma for the three years totaled seventy-three people and accounted for 19% of the study group. Mining companies have moved into the area of Harmons within the past four years (2013) to claim the bauxite in the land. Jamaica is the fourth highest country ranked for the rates of bauxite mining which has led to breathing complications and allergies (Orner, 2012). The high rates of mining for bauxite has created a persistent dust of soil in the air. The dust may be having an impact on increased incidence of asthma identified by the LHU teams over the past three years.

Body Mass Index (BMI) data suggests that the majority of the people in Harmons are of unhealthy weights. Most patients, especially the women (average

BMI= 36.3 kg/m²), fell in the obese classification. As previously stated in the methods section, the World Health Organization (WHO) classifies obese as being equal to or above 30 kg/m² (WHO, 2017). Aside from obesity, underweight patients were the next leading classification for the patients from the clinic.

The average Jamaican diet consists of high levels of fats and carbohydrates which may contribute to the unhealthy BMI and increased incidences of hypertension (Ragoobirsingh, et al, 2006). The data collected for the three-year span was organized according to the systolic blood pressure readings for the clinic's patients. The overall results revealed that most people (51%) were within the classifications of being pre-hypertensive to hypertensive crisis. Women had the highest rates of hypertension (66.5%) although the number of men in the hypertensive categories increased as well. The prevalence of hypertension in Jamaicans is said to be as high, if not higher than the rates of hypertension in the United States (Ragoobirsingh, et al, 2002).

Popular future education topics that were requested by the community of Harmons included blood pressure and hypertension, general health, and asthma. Allergies and sinus complications were also an occasional issue at the clinic and many questions were asked about those health issues. Based on the data collected over three years in Harmons, Jamaica, the LHU team has created a better understanding of the community's health.

Following a better understanding of the health in Harmons, the LHU team can modify the areas of focus when it comes to educating the community and overcoming the challenges it faces. Education should focus on the major health concerns that were discussed in this study as well as education on the treatment for diseases like

asthma and hypertension. More knowledge on healthy diets and exercise can also reduce the incidence of reported hypertension and help to diminish the high rates of obesity. As for asthma, the team may provide education on the disease and how to manage the illness, and how to recognize the signs of respiratory distress.

CONCLUSION

The data for the three-year term was organized and analyzed for the prevalent health complications in Harmons. The major health concerns of residents of Harmons, Jamaica identified by this study were hypertension and asthma. Based on the standards provided by the World Health Organization (WHO) and the American Heart Association (AHA), the community faces high rates of obesity and hypertension. Body Mass Index was also used to categorize the participants based on their overall fitness which is related to their activity level and diet. The results of this study can be used to inform future interventions and education topics for the LHU team to implement in future programs to Jamaica.

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