



SJSM Science

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Health Fair Program

The best way to address a need for the accessible primary health screening is by going to the community – not expecting the community to come to a clinic. The SJSM Health Fair Program is designed just like that. Screenings and education of the Bonairean population are performed during regular annual Health Fair Days, during Rincon Day, the Regatta, Christmas Fair...using SJSM facilities and the equipment, in spaces provided by local authorities, under the tents, in the schools...They are conducted by SJSM students, under the supervision of the faculty. Through the Health Fair program, SJSM students provide early detection of health problems, increase health awareness and promote a healthy lifestyle in Bonaireans for the benefit of the:

 Individuals

Each visitor is provided with the opportunity for counselling, review of health history, of screening results, attention to potential risk areas, determination of personal health goals, and answers to general health questions. Any results outside the normal ranges are, of course, referred to the attending clinician for further management.

 Community

The analysis and the interpretation of the results collected over several years can be used for public health surveillance. The results also provide valuable information to the Public Health Department and may guide its further actions: priority setting,

planning, implementing, and evaluating the efforts in the prevention and the control of the diseases - as outlined in the poster:

Yvette Mbangowah and Faith Nwokorie

ABSTRACT

This study was performed to determine the prevalence of hypertension (HTN) and pre-hypertension (Pre-HTN) in Bonaire, and to investigate Body mass index (BMI), percent body fat (%BF), waist (WC) and hip circumference (HC) as risk factors for HTN.

Demographic information, blood pressure, WC, HC, BMI, and % BF data for 232 residents of Bonaire aged between 4 and 96, who participated in the health fair were used.

T-tests and linear regression analysis were performed to determine the relationship between BP, WC, HC, BMI and % BF. The Prevalence of HTN and pre-HTN in Bonaire were 27% and 43% respectively. WC, HC, BMI and % BF are significantly positively correlated to blood pressure, but when the population was divided into subgroups by sex and age the results were not uniform.

INTRODUCTION

Cardiovascular disease is major cause of morbidity and mortality^[1].

The high prevalence of cardiovascular disease, on the island of Bonaire^[2] is increasing the health care costs for the local government.

Therefore it is important to provide adequate healthcare to the local population of Bonaire by preventing the development of chronic diseases.

There is no recent systematic study available regarding the prevalence of HTN and its risk factor(s) in Bonaire.

The present study was undertaken to better understand the risk of HTN among Bonairean population.

METHODOLOGY

Health measurements were obtained from participants over a three year period at four health fairs organized by SJSM.

A standardized protocol to obtain the BP, Weight, BMI, Height, WC, HC and % BF were obtained during the four health fairs included in the study.

The data analysis was performed using Microsoft excel 2007 for windows, Microsoft excel 2008 for Mac and StatPlus:Mac.

Participants who reported their gender and age were included.

- Separated by sex (Male or Female)
- Separated by age groups (25-49 and 50-79).

Student's t-test were performed to determine the significant difference between parameters for males and females.

Regression analysis was done to find out the correlation between MAP and WC, MAP and HC, MAP and BMI and MAP and %BF for different population groups.

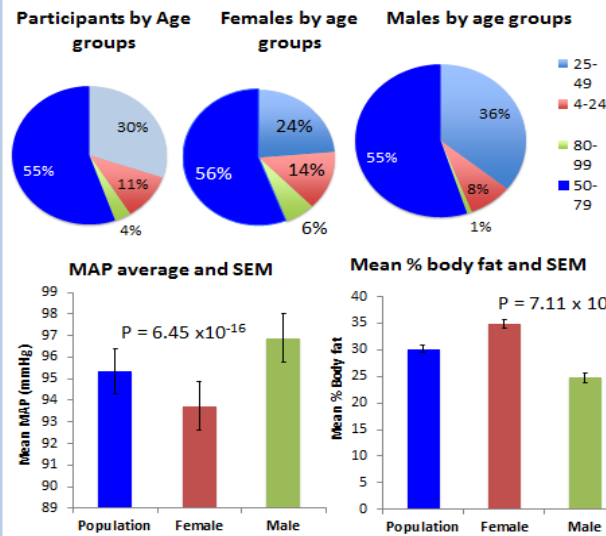
LIMITATIONS

- Some instruments changed over the years.
- Data was collected by students who might have not been experienced.
- Locations of health fairs not ideal for BP of participants

RESULTS

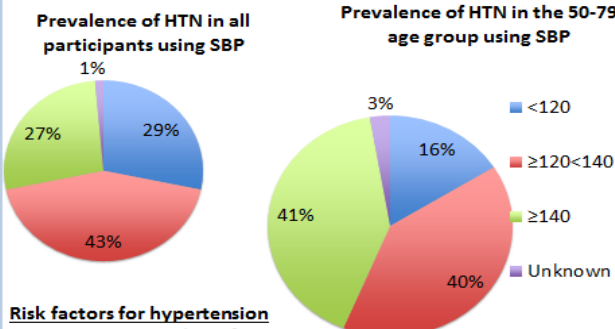
Basic Demographics

Out of the 231 participants, 52% were males and 48% were females. The sample indicated that Bonaire constituted of an aging population.



MAP for males was significantly higher than females.
% BF for females was significantly higher than for males

Prevalence raised blood pressure



Risk factors for hypertension

Linear regression analysis of:

- MAP vs WC
- MAP vs HC
- MAP vs BMI
- MAP vs % BF

The shaded boxes indicate the regression analysis with p values < 0.05 indicating significance.

Linear regression R ² and p-values for MAP vs Waist circumference				
Age group	All Participants	Female	Male	
All Ages	R ² = 0.145 p = 0.0000	R ² = 0.157 p = 0.0003	R ² = 0.135 p = 0.0018	
25-49	R ² = 0.036 p = 0.141	R ² = 0.109 p = 0.0109	R ² = 0.009 p = 0.809	
50-79	R ² = 0.082 p = 0.0453	R ² = -0.002 p = 0.182	R ² = 0.090 p = 0.060	

Linear regression R ² and p-values for MAP vs BMI				
Age group	All Participants	Female	Male	
All Ages	R ² = 0.152 p = 0.0000	R ² = 0.164 p = 0.00003	R ² = 0.162 p = 0.0004	
25-49	R ² = 0.104 p = 0.0053	R ² = 0.085 p = 0.107	R ² = 0.149 p = 0.015	
50-79	R ² = 0.107 p = 0.0067	R ² = 0.111 p = 0.015	R ² = 0.017 p = 0.600	

Linear regression R ² and p-values for MAP vs Hip circumference				
Age group	All Participants	Female	Male	
All Ages	R ² = 0.083 p = 0.0002	R ² = 0.104 p = 0.0034	R ² = 0.101 p = 0.0109	
25-49	R ² = 0.003 p = 0.659	R ² = 0.053 p = 0.260	R ² = -0.013 p = 0.592	
50-79	R ² = 0.056 p = 0.037	R ² = 0.001 p = 0.157	R ² = 0.142 p = 0.017	

Linear regression R ² and p-values for MAP vs % Body fat				
Age group	All Participants	Female	Male	
All Ages	R ² = 0.054 p = 0.020	R ² = 0.150 p = 0.0001	R ² = 0.115 p = 0.014	
25-49	R ² = 0.018 p = 0.295	R ² = 0.009 p = 0.611	R ² = 0.120 p = 0.061	
50-79	R ² = 0.00004 p = 0.984	R ² = 0.106 p = 0.026	R ² = -0.021 p = 0.795	

DISCUSSION

There was 27% prevalence of a SBP > 140mmHg, which is lower than reported in 2009 (28.6%)^[2]. There was a 43% prevalence of pre-hypertension, which is significantly higher than the reported values for the Caribbean^[3], which were 35% (CI, 33-38).

The elderly showed a higher prevalence of HTN but similar prevalence of pre-hypertension to the entire population, but when compared to other the entire Caribbean, the elderly people of Bonaire have a higher prevalence of HTN^[3]. This is explained by the fact that age is a major risk factor for HTN and many other chronic diseases^[4].

Men had significantly higher MAPs, compared to women while women had significantly higher % BF compared to men, which is expected as it has been shown in previous studies^[4, 5]. However, there was no significant difference between the WC, HC, and BMI.

Regression analysis showed that different parameters should be used to screen for HTN in the different age and sex groups in the population. Determined by linear regression analysis with p values < 0.05

Screening test to be used by groups			
Age group	All Participants	Female	Male
All Ages	WC, HC, BMI, %BF	WC, HC, BMI, %BF	WC, HC, BMI, %BF
25-49	BMI	WC	BMI
50-79	WC, HC, BMI	BMI, % BF	HC

CONCLUSION

The prevalence of HTN in Bonaire shows a declining trend, however it is still higher than other Caribbean islands. Bonaire has a higher rate of HTN in its older age group but a similar rate of pre-hypertension when compared to other Caribbean islands.

The population of Bonaire is mostly elderly people who with their age already have a higher risk for HTN.

Population groups should be monitored using different parameters (WC, HC, BMI, % BF) to monitor their risk for development of HTN, leading to CVD.

The groups should be monitored based on the risk factors that show significant correlation to MAP for their respective groups.

FUTURE WORK

More focused studies should be done to reduce prevalence of CVD risks and address the high rate of HTN on the island. The primary emphasis should be focused on the elderly, who are at increased risk of CVD.

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REFERENCES

1. Gaziano, T. (2005). Cardiovascular disease in developing world and its cost-effective management. Retrieved from http://www.who.int/csr/resources/publications/cardiovascular_disease_in_developing_world.pdf
2. Berry-Caban, C., Sanders, L., Adeboye, O. (2009). Self-reported Hypertension on a Caribbean Island. J Clin Med Res. P. 17-23
3. Ferguson, TS, Tulloch-Reid, MK; Younger, NO; McFarlane, SR; Francis, DK; Wilks, RJ. (2011). Prehypertension in Jamaica: A Review of Data from recent studies. West Indian Med Journal. 60 (4) :429-433
4. Despres J-P, Moorjani S, Lupien P-J, Tremblay A, Nadeau A, Bouchard C. (1990) Regional distribution of body fat, plasma lipoproteins and cardiovascular disease. Arteriosclerosis, Thrombosis and Vascular Biology. American Heart Association 1990; 10: 497-511
5. Rimm EB, Stamper MJ, Giovannucci E, Ascherio A, Spiegelman D, Colditz GA & Willett WC (1995): Body size and fat distribution as predictors of coronary heart disease among middle-aged and older US men. Am. J. Epidemiol. 141: 1117-1127.