

Cardiovascular Conditions on the Rise: A Pilot study

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Abstract-

This paper is a pilot study seeking to ascertain the incidence of cardiovascular diseases and its therapeutic successes both in Jamaica and in Barbados. **Method:** EBSCO host data base was used to gain needed literature evidence regarding successful therapeutics for cardiovascular diseases. The review was facilitated by the analysis of relevant literature and the distribution of questionnaires to a cohort of medical technology students in Jamaica. For the pilot study regarding the awareness of collage age students about cardiovascular diseases, a stratum of 28 first year Medical Technology students was conveniently chosen. The evaluation of the statistical data was analysed using SPSS version 25. **Results:** Of the total consenting first year medical technology student population ($N=28$), 20 were female and the latter being male. Thirteen respondents were from ages 16-20 whereas 15 were from 20-24. Twenty-five persons indicated their awareness of cardiovascular diseases while 3 were unaware. Of the respondents, 89.3% were aware of hypertension and cardiac arrest, 76% aware of atherosclerosis and the awareness of other conditions were between 40-45%. Literature review reveals a steady increase in cardiovascular disease and increase successful therapeutics. **Conclusion:** First year Medical Technology students were chosen as they were anticipated to be aware of cardiovascular disease, however it was evident that the group that was chosen for this pilot represented a group of persons who were not aware of the range of illnesses that are associated with cardiovascular diseases. General awareness needs to be improved, as increasingly more deaths are being reported from illnesses thus associated, with little knowledge to arrest the onset of the illness early. The study also highlighted successful therapeutics and technologies in both Jamaica and Barbados, identifying the negative effects of each.

Index Terms- cardiovascular, therapeutics, technologies, awareness

I. INTRODUCTION

This research focuses on successful therapeutics and technologies for cardiovascular conditions on the rise. It highlighted and compared such therapeutics as well as technologies within Jamaica and Barbados. The negative effects of these therapeutics and technologies were also perused and discussed.

The Ministry of Health postulated that cardiovascular diseases occur as a result of ailments of the blood vessels and heart [1]. It publicised common cardiovascular conditions such

as inborn heart disease, failure of the heart, cerebrovascular disease and hypertension [1]. When examined on a global scale, it was seen where cardiovascular diseases induced a spike within a country's mortality rate thus resulting in 17.5 million deaths during 2012 [1, 3, 5]. The World Health Organization predicted the death of 23.6 million persons by the year 2030 from cardiovascular diseases and although the existing paucity of resources was evident among the Caribbean, countries such as Jamaica and Barbados have made improvements where this is concerned [7]. Jamaica has done pacemaker evaluation for patients, echocardiogram, stress echocardiogram and Holter monitor test among other therapeutic options [4]. Barbados implemented a standard hypertension management project and natives have used natural products containing L-Arginine to combat cardiovascular illnesses [9,10,12]. Despite the facts that these therapeutics were helpful, the research showed the negative effects of some such as L-Arginine. The negative effects of technologies such as intravascular and Angiojet thrombectomy were also explored. A survey was done among the student population to assess one's knowledge of such issues. Knowledge of cardiovascular disease will indeed be helpful in preventing future intolerable increases as activities that are done early on in one's life affects the type of disease that they will experience later on in life (60 years). The World Health Organization (WHO) global estimates of mortality and burden of disease, around 17.3 million people died from cardiovascular diseases in 2008 representing 30% of all global deaths. Of these deaths, an estimated 7.3 million were due to coronary heart disease and 6.2 million were due to stroke [20].

Study Context and Conceptual Framework

Cardiovascular conditions for years, has been a sore point to many individuals. The condition has been tested by many professionals with little or no successful interventions. This pilot study will bring to focus, the interventions that have been successful over the few years with the hope to decrease the negative stigma that has been associated with the disease.

Problem statement

The increase of cardiovascular conditions has become of crucial alarm to the world since recently. The severity of its impact on Caribbean countries such as Barbados and Jamaica are due to their lack of medical resources and also because of the unhealthy lifestyle many of the natives have adapted.

Rational and Justification

Jamaica and Barbados, though lacking in resources and information to manufacture possible cures, have been introduced to new affordable technologies and therapeutics which have been proven to reduce the prevalence of cardiovascular conditions. The findings of this research will be beneficial to several developing countries as they will be able to implement such to decrease a population's mortality rate.

Purpose of study

This study's aim was to explore the potency of cardiovascular therapeutics and technologies in Jamaica and Barbados and also to investigate the negative effects of some of these therapeutics. The prevalence of cardiovascular diseases in today's society have become quite alarming, more so in the Caribbean countries, and as such, there is a need for interventions in the therapeutic and technological aspect as one seeks to combat these diseases. The World Health Organization describes cardiovascular disease as varying disorders of the blood vessels and heart and predicts the death of 23.6 million people in 2030 from such diseases [7]. Caribbean countries, Jamaica and Barbados have had new developments in cardiovascular therapeutics and technologies, with some being of a similar nature while others differ.

II. BACKGROUND

As it relates to cardiovascular diseases in Jamaica, the country's Minister of Health, Dr. Christopher Tufton, posits that these diseases have caused 34.8 % of death within the nation over the past five years [2]. Screening for blood pressure is highly recommended for persons 20 and above and persons were encouraged to do such checks at every doctors visit and as such, blood pressure checks were implemented and initiated in healthcare facilities regardless of a person's illness. If it is recognized that a person has irregularities in blood pressure, further medical assistance is provided, and the appropriate drug administered [2]. The Automated External Defibrillator is used to restart the heart in conjunction with cardiac pulmonary resuscitation in the case of sudden cardiac arrest and has been promulgated to the population via the Jamaica Information Service [2]. The Heart Foundation of Jamaica has implemented several therapeutic options as well as technologies to provide efficient treatment for varying cardiovascular conditions. The foundation has extended its capacities and has now implemented a larger pharmacy that provides both over the counter and prescription drugs. There has also been pacemaker evaluation for patients, echocardiogram, stress echocardiogram and Holter monitor test [2, 4]. Considerations are currently being made for a Cardiac Rehabilitation programme [4]. This programme will use physical, medical as well as psychosocial methods to combat recurring cardiac conditions as well as prevent them. Herbs such as breadfruit leaves are used to treat high blood pressure among the locals [5]. Rytidophyllum tomentosum (Search Mi Heart) is also used to treat multiple heart conditions [6]. Exercise is currently being used as a form of therapeutic for cardiovascular disease patients and persons at risk [8]. These persons have been encouraged to participate in events such as the Reggae, 5K and 10K marathons as exercise improves cardiovascular health.

As it relates to prevalent cardiovascular conditions in Barbados, there was a record of Barbados on the verge of such epidemic in 2015 as more than a third of the population suffered from hypertension [9].

"The Barbadian government in collaboration with the WHO Pan-American Health Organization and the US Centres for Disease Control and Prevention embarked on a project to further improve the treatment of hypertensive individuals through a few clinics on the island. The efficacy was evident as there was an increase in the control rate of hypertensive individuals since the initiation of the project. These procedures assessed individuals' lifestyle as it targeted the risk factors. There was improvement in access to medications and technologies, exercise, reduction of salt intake and also a decrease in tobacco and alcohol consumption." [9,10]

"The Barbadian government also invested in the initiative to decrease sudden cardiac arrest deaths through the introduction of Cardiopulmonary resuscitation training and the usage of an external defibrillator that is automated. Both public and private sector individuals were encouraged to seek training in regard to these techniques for the reduction of mortality and morbidity from sudden cardiac arrest deaths." [11]

It was seen where Barbadian natives with cardiovascular conditions had begun to use alternative methods as a form of therapy.

Natural products such as L-Arginine and Blood Pressure Wellness have become ubiquitous among the Barbadian market. These products were proven to help with regulation of cholesterol, the dissolving of blood clots and also helps with preventing heart attacks and strokes. [12]

Additionally, a paediatric cardiac surgical programme was established at the Queen Elizabeth Hospital in association with Northshore University Hospital in New York has since 1982. This programme has raised the standards of care for those in the QEH and not only benefits Barbadians but also citizens in other Caribbean countries. [13]

The Advanced Cardiovascular Institute has introduced new interventions to the world of cardiovascular diseases. [14]

"These interventions have provided essential new tools for physicians that therapeutically alter consequences for publics anguishing from a vascular ailment" [19].

These therapeutics are known as Intravascular Ultrasound and Angiojet Thrombectomy [14]. The intravascular intervention consists of an ultrasound system which includes an intravascular catheter with an ultrasound transducer array, a transmit beamformer, a receive beamformer, and an image generator [15]. "Through fragmentation and suction by rheolytic procedures, the Angiojet thrombectomy catheter is able to remove thrombi" [16]. Thrombi, also known as intracoronary thrombus is associated with Myocardial infarction.

The National Center for Biotechnology Information postulates that the Intravascular ultrasound has a higher efficacy than the AngioJet thrombectomy [17]. When studies were carried out the outcome observed supported the above statement, in that only 0.4% of convalescents who endured Intravascular guided ultrasound imbedding had major cardiac events one-year post procedure, compared to a 1.2% of patients who underwent Angiojet thrombectomy guided procedure and suffered adverse

cardiac events. The major cardiac events are myocardial infarction, or stent thrombosis.

WedMD posists,

"that L.Arginine is an amino acid that is used to treat cardiovascular conditions such as: congestive heart failure (CHF), chest pain, high blood pressure, and coronary artery disease. However, there are a few side effects experienced by patients who receive this treatment either orally, through and injection/shot and via skin application. The side effects experienced are: "gut pains, bloating, diarrhoea, gout, abnormalities of the blood, allergies, airway inflammation, worsening of asthma, and hypotension" [18].

There are other Cardiovascular technologies and interventions available in Jamaica and Barbados which have adverse side effects. These interventions and technologies however will be acknowledged later in the research, an example is The Holter Monitor Test.

III. METHOD

This research was carried out by using critical information from the perusal of various journal articles and

websites as it relates to treatment options for prevalent cardiovascular conditions and negative effects of such found using the EBSCO host data base. Research data was obtained from organizations such as the World Health Organization and the Advanced Cardiovascular Institute and newspaper articles from The Jamaica Gleaner and Observer. Magazines such as the Barbados Advocate and Heartline Magazine were also used to facilitate the study. To complete the pilot study, a questionnaire was sent out among the population (28) of first year Medical Technology students at a prominent tertiary institution in central Jamaica, after receiving consent and tested their awareness on Cardiovascular conditions. The data was recorded and analysed using the Statistical Package for Social Scientists (SPSS) software version 25 and results were tabulated.

Statistical Analysis

SPSS version 25 software analysed the data and tabular representation was done.

IV. RESULTS



Figure 1: Relationship of gender to age

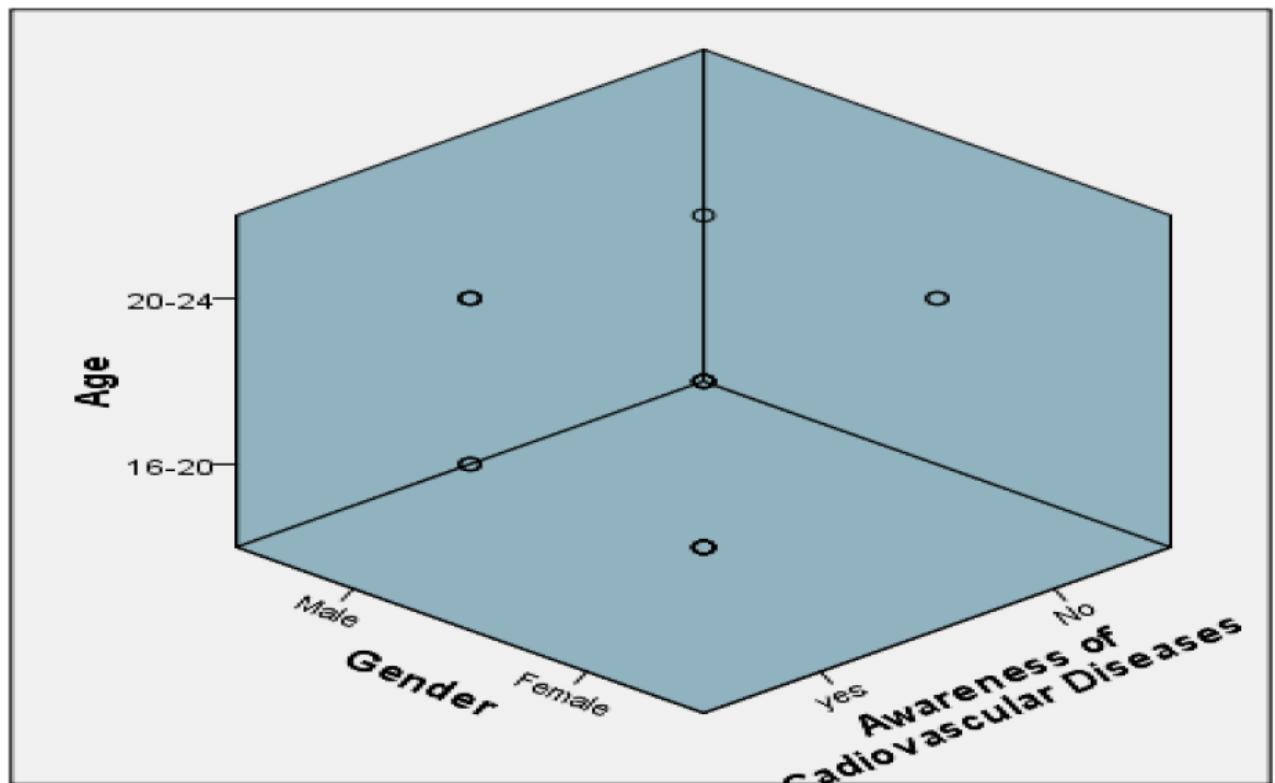


Figure 2: Relationship of gender and age to awareness of cardiovascular disease

Awareness of Cardiovascular Diseases

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	3	10.7	10.7	10.7
	Yes	25	89.3	89.3	100.0
	Total	28	100.0	100.0	

Table 1: Numerical expression of the awareness of cardiovascular disease

The Heart Conditions You Know

		Frequenc		Valid	Cumulative
		y	Percent	Percent	Percent
Valid	Ischaemic Heart Disease	4	14.3	100.0	100.0
Missing	System	24	85.7		
	Total	28	100.0		

Table 2: percentage of participants in the pilot who were aware of Ishaemic Heart disease

The Heart Conditions You Know

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Pericarditis	8	28.6	100.0	100.0
Missing	System	20	71.4		
Total		28	100.0		

Table 3: Percentage of participants in the pilot who were aware of Pericarditis

The Heart Condition You Know

		Frequenc		Valid	Cumulative
		y	Percent	Percent	Percent
Valid	Endothelial	1	3.6	100.0	100.0
	Dysfunction				
Missing	System	27	96.4		
Total		28	100.0		

Table 4: Percentage of participants in the pilot who were aware of endothelial dysfunction

The Heart Conditions You know

Atherosclerosis

		Total	
Gender	Male	5	5
	Female	14	14
Total		19	19

Table 5: Number of person's male/females who are aware of Atherosclerosis

The Heart Conditions You Know

Hypertension

		Total	
Gender	Male	7	7
	Female	18	18
Total		25	25

Table 6: Number of person's male/females who are aware of Hypertension

The Heart Conditions You know

Rheumatic Fever

Gender		Total	
		4	4
	Female	6	6
Total		10	10

Table 7: Number of person's male/females who are aware of Rheumatic Fever

V. DISCUSSION:

The data obtained from the questionnaire shows that there were 28 participants involved within the study, with 8 being male and 20 being female (figure 1&2). It was evident that the female population far exceeded the male by 42.8% as the percentage of males was recorded as 28.6 % with 71.4% being females. It was recorded and observed that all participants responded to the question concerned with their age group, with 46.4 % (13) of respondents coming from the age group 16-20 with 53.6% (15) of respondents from ages 20 -24. The question that tested the individuals' awareness of cardiovascular diseases was responded to by all participants with 25 responses recorded as yes and 3 as no (see figure 2, see table 1). The question that tested the participants' knowledge of cardiovascular conditions was answered by 25 out of 28 (89.3%) participants. It showed that conditions such as Cardiac Arrest and Hypertension were known by 25 participants while 3 did not respond (see table 6). This was followed by Atherosclerosis that was known by 19 participants (76% of respondents) with 3 not responding (see table 5). Conditions such as Rheumatic Fever, Pericarditis and Angina Pectoris were among others that individuals were fairly aware of, with 10 (40%) persons being aware of Rheumatic Fever (see table 6) and 8 persons (32%) being aware of Pericarditis and 9 persons (36%) being aware of Angina Pectoris. The least known conditions were Ischaemic Heart Disease and Endothelial Dysfunction (see table 2). There were only 4 persons (16%) out of the 25 respondents with 3 not responding who were aware of Ischaemic Heart Disease and 1 individual (4%) who was aware of Endothelial Dysfunction. The question that tested the participants' knowledge of cardiovascular conditions as the leading cause of death, was responded to by all 28 persons. Three persons (10.7%) responded with no while 25 persons (89.3%) responded with yes still 3 did not respond. The question that tested the participants' awareness of precautionary measures to treat cardiovascular conditions was responded to by all 28 participants with 24 persons indicating yes and 4 no. There were 28 responses as it relates to making dietary/lifestyle changes to

lower the risk of these diseases with 27 (96.4%) respondents saying yes and 1 (3.6 %) individual saying no. There were 17 (60.7%) persons from the 28 respondents who knew persons with cardiovascular conditions and 11 (39.3%) who did not. Sixteen persons (57.1%) knew 1-4 individuals while 1 (3.6%) person knew 5-9 individuals. The 28 individuals all responded to the question that tested their awareness of the life expectancy of cardiovascular conditions with 14 (50%) responses recorded as yes and 14 (50%) as no. Cardiovascular diseases have been estimated to be the leading cause of death and disability-adjusted life years (DALY) lost globally [20]. Low to middle income countries to which Jamaica and Barbados are apart have experienced an increase in the prevalence of cardiovascular heart diseases and 80% of the global burden of Cardiovascular disease occurs in this low to middle income regions of the world [20]. With the increased incidents of same the DALY-healthy years of life lost and combines years of potential life lost due to premature death with years of productive life lost due to disability, thereby, indicating the total burden of a disease as opposed to simply the resulting death. Within the coming decades, DALYs estimate for cardiovascular disease is expected to rise from a loss of 85 million DALYs in 1990 to a loss of 150 million DALYs globally in 2020, thereby remaining the leading somatic cause of loss of productivity. As for coronary heart disease global burden, this is projected to rise from around 47 million DALYs globally in 1990 to 82 million DALYs in 2020 [20]. Looking on the trend seen from the pilot analysis is give insight that the age group between 16 to 25 are seemingly unaware of the range of cardiovascular diseases and therefore if are not properly educated will continue with the same lifestyle habits into old age. There by developing similar health related issues highlighted in the study.

VI. CONCLUSION:

Based on the results obtained from the pilot study survey, it was evident increase knowledge is need regarding cardiovascular illnesses by all persons including college students. With the real

sample size for the full study being proposed to be 1000 persons, a more in-depth analysis will better be able to enhance the conclusiveness of the study. It was also realized that there were more persons from age group 16-20 as opposed to age group 20-24 who gave a positive response to the question asking if they were aware of cardiovascular diseases. Cardiac arrest, Hypertension and Atherosclerosis were the top three most known conditions while Ischaemic, Pericarditis and Endothelial Dysfunction were the least known conditions each with percentages of 36% and under. Through in-depth research many successful therapeutics and technologies have been observed in both Jamaica and Barbados for the cardiovascular conditions mentioned. This research has also identified the unsuccessful therapeutics due to their negative effects on witnessed participants.

VII. RECOMMENDATION:

To increase awareness for cardiovascular conditions, schools and businesses should be encouraged to recognize February as Heart Month, walks such as the cardiovascular march can be hosted locally, and brochures and pamphlets should be made available and accessible to the public. General health seminars should be held at least twice a year at schools and work places to inform and keep the society up-to-date with the prevalence, prevention and treatment of cardiovascular diseases and conditions.

Supplementary Materials: No supplementary material.

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