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Knowledge, attitudes, beliefs and responses of type 2 diabetes clients toward acute coronary syndrome

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Knowledge, attitudes, beliefs and responses of type 2 diabetes clients toward  
acute coronary syndrome

Master Thesis presented to the Graduate Program in  
Fundamental Nursing of the University of São Paulo at  
Ribeirão Preto College of Nursing, for Master's level

Line of research: Caring for adults and elderly

Supervisor: Lídia Aparecida Rossi

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## **DEDICATION**

*This Master's thesis is dedicated to my three loving children and my advisor. During the long nights of frustration, anxiety and thoughts of quitting, my eldest son sent me a message that read, "Mom, God is able. He will never give you more than you can handle". My daughter jolted my memory when she said, "Mom, as children you taught us scriptures of faith. Remember, you can do all things through Christ who gives you strength". My youngest son said, "Mom, I have never known you to be a quitter, so why now?"*

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## RESUMO

JOHNSON, C.A.H. **Conhecimento, atitudes, crenças e respostas dos clientes com diabetes tipo 2 em relação à síndrome coronária aguda.** 2020. 76 f. Dissertação (Mestrado) – Escola de Enfermagem de Ribeirão Preto, Universidade de São Paulo, Ribeirão Preto, 2020.

**Introdução:** A resposta a uma ameaça à saúde, como os sintomas da síndrome coronariana aguda (SCA), é determinada pela capacidade do paciente de identificar os sintomas, estabelecendo a relação com a doença e de responder apropriadamente. Essa importante habilidade das pessoas com diabetes tipo 2, em risco de ter essa síndrome, pode ser mais bem compreendida avaliando-se o conhecimento percebido, as atitudes e as crenças em relação à SCA e à resposta a ela. **Objetivos:** Avaliar o conhecimento percebido, atitudes e crenças percebidas de clientes com diabetes tipo 2 em relação à síndrome coronariana aguda; explorar as associações entre as medidas da síndrome coronária aguda percebida e as variáveis sócio demográficas e clínicas; e explorar as correlações entre as medidas da síndrome coronária aguda percebida e os sintomas de ansiedade e depressão. **Métodos:** O estudo foi realizado em Linden, Guiana, com 60 clientes com diabetes tipo 2, utilizando-se um questionário de dados sócio demográficos e clínicos, o Acute Coronary-Response Index (ACS-Response Index) e a Escala Hospitalar de Ansiedade e Depressão (HADS). Todos os questionários foram preenchidos pela pesquisadora por meio de entrevistas individuais. Análises descritivas foram realizadas para todas as variáveis. O teste de Mann-Whitney foi utilizado para comparar as medidas do ACS-Response Index e dos sintomas de ansiedade e depressão (HADS) com sexo, idade, tempo de diagnóstico e índice de massa corporal. Foram feitas comparações entre as medidas das subescalas do ACS - Índice de Resposta e os níveis de escolaridade (primário, secundário, universitário e profissional) usando o teste de Kruskal-Wallis para comparações múltiplas. Utilizou-se o coeficiente de correlação de Spearman para calcular as correlações entre as medidas do ACS-Response Index e os sintomas de ansiedade e depressão. Para todos os testes, o nível de significância foi estabelecido em 0,05. **Resultados:** O escore médio total da subescala Conhecimento foi de 9,12 (D.P. = 3,4). Dois participantes tiveram mais que 70% de acertos nessa subescala. O número de participantes que reconheceu os principais sintomas da SCA variou de 27,1% a 49,2%. Os escores médios total das subescalas Atitudes e Crenças foram 11,2 (D.P. = 3,5) e de 21,3 (D.P. = 4,5), respectivamente. Pacientes universitários tiveram melhor conhecimento quando comparados aos clientes com clientes que possuíam nível primário ( $p = 0,043$ ). Foi encontrada correlação forte e positiva entre a subescala Conhecimento e os sintomas de depressão, mas não estatisticamente significante ( $r = 0,63$ ;  $p = 0,67$ ). A correlação entre as subescalas Atitudes e Crenças foi negativa e fraca e não estatisticamente significante. A correlação entre os sintomas de ansiedade e a subescala Crenças foi estatisticamente significante, negativa e forte ( $r = -0,53$ ;  $p < 0,001$ ). **Conclusões:** Clientes com diabetes tipo 2, participantes deste estudo, apresentaram baixo nível de conhecimento sobre a SCA. Constatou-se um efeito do nível educacional sobre a subescala Conhecimento. O conhecimento sobre a SCA pode melhorar a capacidade do paciente em identificar os sinais e sintomas do infarto agudo do miocárdio.

**Palavras-chave:** Conhecimento. Diabetes. Síndrome coronária aguda. Atitudes. Crenças

## ABSTRACT

JOHNSON, C. A. H. Knowledge, attitudes, beliefs, and responses of type 2 diabetes clients toward acute coronary syndrome. 2020. 76 pp. Thesis (Master's Degree) – Escola de Enfermagem de Ribeirão Preto, Universidade de São Paulo, Ribeirão Preto, 2020.

**Introduction:** The response to a health threat, such as acute coronary syndrome symptoms (ACS), is determined by the patient's ability to identify the symptoms, establish the relationship with the disease and respond appropriately. This important ability of people with type 2 diabetes, who are at risk of having this syndrome, can be better understood by assessing the knowledge, attitudes, and beliefs concerning the ACS and the response to it.

**Objectives:** To evaluate the perceived knowledge, attitudes, and beliefs of type 2 diabetes clients toward acute coronary syndrome; to explore the association between the measures of the perceived acute coronary syndrome and their sociodemographic and clinical characteristics; and to explore the correlations between the measures of the perceived acute coronary syndrome and the measures of anxiety and depression symptoms. **Methods:** The study was carried out at Linden, Guyana, with 60 type 2 diabetes clients using a sociodemographic and clinical data questionnaire, the Hospital Anxiety and Depression Scale questionnaire, and Acute Coronary-Response Index. All questionnaires were completed by the researcher during a face to face interview with each client. Descriptive analyses were performed for all variables. The Mann-Whitney test was used to compare the scores of the ACS Response Index subscales and the HADS anxiety and depression symptoms with sex, age, time since diabetes diagnosis and body mass index (not overweight or overweight). Comparisons were made between the measures of the ACS - Response Index subscales and educational levels (primary, secondary, university and professional) using the Kruskal-Wallis test for multiple comparisons. The Spearman's correlation coefficient was used to calculate the correlations between the scores of the ACS – Response Index subscales and the anxiety and depression symptoms. The significance level for all the tests that were conducted was set at 0.05. **Results:** The total mean score of the Knowledge subscale was 9.12 (S.D.=3.4). Two participants had more than 70% of the correct answers. The number of participants who recognized the main symptoms of acute coronary syndrome varied from 27.1% to 49.2%. The total mean score of the Attitudes subscale was 11.2 (S.D.=3.5) and for beliefs 21.3 (S.D.=4.5). Clients with university level had better knowledge when compared to clients who had primary level ( $p=0.043$ ). Strong and positive correlation was found between knowledge and symptoms of depression, but not significant ( $r=0.63$ ;  $p=0.67$ ). The correlation between Attitudes and Beliefs was negative and weak and not significant. The correlation between symptoms of anxiety and beliefs was statically significant, negative, and strong ( $r=-0.53$ ;  $p<0.001$ ). **Conclusions:** Type 2 diabetes clients participating in this study showed a low level of knowledge about ACS. There was an effect of the educational level on the Knowledge subscale. The knowledge of the ACS risks improved the patients' ability to identify their signs and symptoms and respond appropriately to a cardiac event.

**Keywords:** Knowledge. Diabetes. Acute coronary syndrome. Attitudes. Beliefs.

## RESUMEN

JOHNSON, C. A. H. **Conocimientos, actitudes, creencias y respuestas de los clientes con diabetes tipo 2 en relación al síndrome coronario agudo.** 2020. 76 h. Disertación (Maestría) – Escola de Enfermagem de Ribeirão Preto, Universidade de São Paulo, Ribeirão Preto, 2020.

**Introducción:** La respuesta a una amenaza para la salud, como los síntomas del síndrome coronario agudo (SCA), está determinada por la capacidad del paciente para identificar y localizar físicamente los síntomas, determinando su relación con la enfermedad y la respuesta del paciente al momento de su aparición. Esta importante capacidad de las personas con diabetes tipo 2, que están en riesgo de sufrir SCA, se puede comprender mejor si se evalúan los conocimientos, las actitudes y las creencias percibidas y la respuesta al SCA. **Objetivos:** Evaluar el conocimiento, las actitudes y las creencias percibidas de los clientes con diabetes tipo 2 en relación con el síndrome coronario agudo; explorar la asociación entre las medidas de síndrome coronario agudo percibida e y las características sociodemográficas y clínicas; y explorar las correlaciones entre las medidas del síndrome coronario agudo percibido y las medidas de los síntomas de ansiedad y depresión. **Métodos:** El estudio fue realizado en Linden, Guyana, con 60 clientes con diabetes tipo 2, utilizando un cuestionario de datos sociodemográficos y clínicos, el Acute Coronary-Response Index (ACS-Response Index) y la Escala de Ansiedad y Depresión Hospitalaria (HADS). Todos los cuestionarios fueron llenados por el investigador mediante entrevistas individuales. Se realizaron análisis descriptivos para todas las variables. Se utilizó la prueba de Mann-Whitney para comparar las puntuaciones de los dominios del ACS-Response Index y los síntomas de ansiedad y depresión (HADS) con el sexo, la edad, el tiempo desde el diagnóstico y el índice de masa corporal. Se realizaron comparaciones entre las medidas de las subescalas ACS - Índice de Respuesta y los niveles educativos (primaria, secundaria, universitaria y profesional) utilizando la prueba de Kruskal-Wallis para comparaciones múltiples. Se utilizó el coeficiente de correlación de Spearman para calcular las correlaciones entre las puntuaciones de las subescalas del ACS-Response Index y los síntomas de ansiedad y depresión de la HADS. Para todas las pruebas, el nivel de significancia se estableció en 0.05. **Resultados:** La puntuación total media de la subescala de Conocimientos fue de 9,12 (DE = 3,4). Dos participantes tenían más del 70% de respuestas correctas en esta subescala. El número de participantes que reconocieron los principales síntomas del síndrome coronario agudo osciló entre el 27,1% y el 49,2%. El puntaje total promedio para la subescala Actitud fue 11.2 (DE = 3.5) y para Creencias 21.3 (D. D. = 4.5). Los clientes con nivel universitario tenían un mejor conocimiento en comparación con los clientes con nivel básico ( $p = 0,043$ ). Se encontró una correlación fuerte y positiva entre el conocimiento y los síntomas de depresión, pero no estadísticamente significativa ( $r = 0,63$ ;  $p = 0,67$ ). La correlación entre actitudes y creencias fue negativa y débil y no estadísticamente significativa. La correlación entre los síntomas de ansiedad y la subescala creencias fue negativa y fuerte y estadísticamente significativa ( $r = -0,53$ ;  $p < 0,001$ ). **Conclusiones:** Los clientes con diabetes tipo 2 que participaron en este estudio mostraron un bajo nivel de conocimiento sobre la SCA. Hubo un efecto del nivel de educación en la subescala Conocimiento. El conocimiento de los riesgos de SCA mejora la capacidad del paciente para identificar sus signos y síntomas y responder adecuadamente a un evento cardíaco.

Palabras clave: Conocimiento. Diabetes. Síndrome coronario agudo. Actitudes. Creencias

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## **LIST OF ABBREVIATION**

<b>ACS</b>	Acute Coronary Syndrome
<b>BMI</b>	Body Mass Index
<b>CARICOM</b>	Caribbean Community
<b>CHD</b>	Coronary Heart Disease
<b>cm</b>	Centimeter
<b>CVD</b>	Cardiovascular Disease
<b>HADS</b>	Hospital Anxiety and Depression Scale
<b>HCC</b>	Healthy Caribbean Coalition
<b>IDF</b>	International Diabetic Federation
<b>IHD</b>	Ischemic Heart Disease
<b>IHME</b>	Institute for Health Metrics and Evaluation
<b>Kg</b>	Kilogram
<b>NACR</b>	North America and Caribbean Region
<b>NCD</b>	Non-Communicable Disease
<b>PAHO</b>	Pan American Health Organization
<b>SD</b>	Standard Deviation
<b>WHO</b>	World Health Organization

## SUMMARY

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## **1. INTRODUCTION**

## 1. INTRODUCTION

The leading causes of death and disability worldwide result from non-communicable diseases (NCDs), such as, cardiovascular diseases, cancer, diabetes and chronic respiratory diseases. Seventy percent of the total deaths or seven in ten deaths around the world result from NCDs of which cardiovascular diseases account for majority of the cases (World Health Organization [WHO] 2018a). People are now more affected by NCDs during their most economically productive years, 30 to 69 years (WHO, 2018a). Additionally, NCDs can interfere with an individual's level of confidence in securing, health and well-being owing to their chronic, long lasting effects (Saha & Alleyne, 2018).

Moreover, the lower and middle-income countries have the greatest health burden of NCDs, since over three quarters of deaths from NCDs take place in these countries (Islam et al. 2014; WHO, 2018; Razzaghi et al., 2019). The NCDs are also the greatest health problem for the countries of the Caribbean Community (CARICOM), where death and disability by NCDs exceed those by infectious diseases, and the estimate of premature mortality rates is twice as high in comparison to wealthy countries (Razzaghi et al., 2019; Healthy Caribbean Coalition [HCC], 2014). These small and fragile countries are unable to sustain the human and economic burden of NCDs.

Cardiovascular diseases (CVD) are the main cause of deaths and accounts for an estimated 17.9 million or 31% of all global deaths (WHO, 2017a), while Ischemic heart disease (IHD) and stroke account for 85% of the total deaths.

Finegold, Asaria and Francis (2013) analyzed mortality data from cardiovascular diseases gathered from WHO member states and United Nation population data. They found that IHD was the leading cause of death worldwide, with more than 80% of the global deaths occurring in low- and middle-income countries. Additionally, population aging contributed to IHD being the leading cause of death in developed countries.

In the working age population, IHD mortality is markedly higher in low- and middle-income countries. Notwithstanding this, it is felt that the control of hypertension and environmental factors (air pollution, and chemical and physical agents), the use of tobacco and alcohol; combined with the promotion of healthy diet and physical activity, can reduce 80% of premature deaths from CVD, diabetes and stroke (WHO, 2009; WHO, 2016).

IHD is characterized by the atherosclerotic plaque formation in the coronary arteries limiting the blood flow to the heart's muscle (WHO, 2017a). In Guyana, in 2016, cardiovascular diseases were responsible for 34% of all deaths (Gampat, 2019), making it the

leading cause of death in the 30-69 age group (Pan-American Health Organization/World Health Organization [PAHO/WHO], 2014).

Reducing premature mortality from CVD, in the most populous American countries, can facilitate the achievement of the goal of a 25% reduction of deaths from NCDs by 2025 as proposed by the United Nations General Assembly. However, the high rate of premature mortality in the English-speaking Caribbean countries and small populations, makes it difficult to forecast a reduction (Ordunez et al., 2015).

Type 2 diabetes is a chronic metabolic condition, characterized by higher blood glucose levels than normal International Diabetes Federation (IDF, 2017), which is an important risk factor for IHD (Perk, 2017). According to WHO (2017b), diabetes is the fourth leading cause of death globally, and a high-risk factor for cardiovascular diseases.

In 2015, an estimated 415 million people globally, between 20 and 79 years old had w diabetes and it was projected that this number will rise to 642 million by 2040. Hence, there is an important social and economic impact with implications on health care system related to continued rise in the diabetes prevalence and to the deaths associated with this condition across the globe (Ogurtsova et al., 2017). Further, the global increase of diabetes mellitus, an important cardiovascular risk factor, can contribute to the increase of cardiovascular disease-related illness and death (Perk, 2017).

In 2015, the number of diabetic cases in Guyana was 49,800. The WHO's country profile (PAHO/WHO, 2016) revealed that most deaths occurred between ages 30-69 years. Further, the International Diabetic Federation (IDF) members in Guyana (2017), noted that the total adult population in 2017 was 463,100 and of this population 52,400 had diabetes.

According to the Health in the Americas-Country Report Guyana (PAHO/WHO, 2017), Guyana's population grew by 7% between 2010 and 2015. At that time, the country had 737,718 inhabitants. With a life expectancy at birth of 66 years, the population is mainly multi-ethnic (Indo-Guyanese -40% of the total population, Afro-Guyanese (26%), Amerindian (11%), and ethnically mixed - 20%). The Chinese, Portuguese, and white populations together constitute less than 1% of the total population.

### **1.1. Statement of the Problem**

Guyana is one of the 24 countries of the International Diabetes Federation North America and Caribbean Region (IDF – NACR). Globally, 425 million people have diabetes; more than 46 million people live in the NAC Region. It is estimated that this number will reach to 62 million in 2045 (IDF, 2017).

Currently, in Linden, Guyana's second largest town, there is no evidence of the level of understanding of IHD among those who are high risk, such as persons with diabetes, hypertension, and obesity. Hence, high-risk populations' ability towards self-efficacy is unknown. However, evidence suggests that determining the baseline level of health literacy in a community, provides insights for health promotion and successful health outcomes (Vaidya, Aryal & Krettek, 2013). Therefore, the population of Region 10 Linden's ability to reduce risks, has not been determined.

It is therefore important to explore the level of knowledge and beliefs in type 2 Diabetes clients regarding CHD and their attitudes in response to symptoms of acute coronary syndrome, since these conditions are among the most common causes of mortality in Guyana (Ogurtsova et al., 2017).

Although the number of cases for IHD, in Guyana, by administrative regions, is not known, the increasing aging population and the prevalence of type 2 diabetes are recognized as IHD risk factors and a global priority (Chiha, Njeim & Chedrawy, 2012). In a study carried out in Sri Lanka, Associations were found between knowledge and life style and between food and illness-related myths specific local culture, and other variables as metabolic syndrome and anthropometric profiles. These factors determine cardiovascular disease risks. These findings suggested that intervention programmes could be relevant for positive behavioral outcome (Amarasekara et al., 2016).

Region 10 is a multiracial, multi-ethnic, and culturally diverse community with a significant number of type 2 diabetes cases like other parts of Guyana. Therefore, it is imperative to determine diabetic clients' level of knowledge about diabetes, their beliefs about acute coronary syndrome, and their attitude and response to this cardiac event.

Evidence has shown that the burden of disability increased due to NCDs which accounted for 80 % of disability in 2017 (Institute for Health Metrics and Evaluation [IHME], 2017). Bloom et al. (2011) noted that mental health conditions and cardiovascular diseases are the main culprits of the burden of NCDs around the world. However, Type 2 diabetes mellitus and fatty liver disease are also associated with increased disability throughout different levels of development worldwide (IHME, 2017).

Research has shown that, while cardiovascular disease and diabetes co-exist, coronary artery disease is the major cause of death among persons with Type 2 diabetes. The authors cited the need for more evidence in the form of registry studies which will allow for easy quantification of the prevalence of CVD among persons with type 2 diabetes worldwide (Einarson et al., 2018). It was observed that the prevalence of depression is high and there is a two to four times increase in prevalence of prolonged depression in clients with non-communicable diseases (NCDs), such as cancer, diabetes mellitus, stroke or cardiovascular disease, in comparison with people who do not have a NCDs (Anwar et al., 2017).

Type 2 diabetes and coronary artery disease are priority NCDs on the global and national agenda. However, prior to 2008, the Ministry of Health, Guyana, did not focus on prevention of these conditions and/or their complications. The focus of the Ministry of Health was primarily on ensuring that essential drugs to treat the conditions were available.

In the years leading up to 2008, the surgical units of the public hospitals faced alarming admission rates of patient with type2 diabetes who had suffered foot complications. Almost half of the cases resulted in the amputation of the lower extremities (Lowe et al., 2015). In a joint partnership with Canada, the Guyana Diabetes and Foot care project was implemented. The partnership facilitated training of health care professionals to function in the diabetic foot-care centers that were established in several regions of the country. The he education programs in the partnership project aware also primarily centered on foot care (Lowe et al., 2015).

However, as the economic burden of NCDs rose globally, and particularly in lower- and middle-income countries, the Government of Guyana, being a country with a relatively small economy, joined forces with the global community in the fight against NCDs. As a result, in 2013, the Ministry of Health, Guyana began embarking on improving programs for better screening and public awareness to reduce the number of NCD related deaths (Ministry of Health, Guyana, 2013).

The interventions that were implemented targeted primary and secondary prevention not only for type 2 diabetes, but also the other NCDs that are of high priority globally (Ministry of Health, Guyana, 2013). As such, mass media campaigns, reality television shows, health promotion in schools, work and church-based programmes, social media (Facebook, Twitter) were major vehicles through which the Ministry of Health educated the citizens of Guyana (Ministry of Health, Guyana, 2013).

This research is focused on knowledge, attitudes, and beliefs of adult clients diagnosed with type 2 diabetes, 36 months or less regarding ACS. The time since the diagnosis was

deliberated considering the possibility that the results of this investigation may contribute to development of educational interventions focused on type 2 diabetic clients' awareness of their cardiovascular risks, reducing suffering, morbidity, and mortality.

In addition, this research will provide knowledge that can guide policy makers to sponsor more health systems research, improving the effectiveness of health care and reducing the financial burden associated with the complications of diabetes mellitus. Clients who have knowledge of the risk factors for heart disease can are better able to identify their risks for the development of heart disease, and the signs and symptoms of acute myocardial infarction. Further, the results of this study may also contribute to a better understanding of the nursing process by students and nurses from the clients' perspectives. In this instance, clients are regarded as experts based on their experiences and knowledge gained from living with and being treated for their condition. Hence enabling nurses and clients to be equal partners in goal setting and implementation of care is important.

The research questions of this study are:

- 1) What is the knowledge that clients with type 2 diabetes have regarding ACS?
- 2) What are the attitudes and beliefs of type 2 diabetes clients toward ACS?
- 3) Are there associations among knowledge, attitudes, beliefs of type 2 diabetes clients regarding ACS and their socio demographic and clinical characteristics?
- 4) Are there correlations among perceived knowledge, attitudes, beliefs of type 2 diabetes clients regarding ACS and the measures of anxiety and depression symptoms?

## **2. OBJECTIVES**

## **2. OBJECTIVES**

- 1) To evaluate the perceived knowledge, attitudes, beliefs of type 2 diabetes clients toward acute coronary syndrome.
  
- 2) To explore the association between the measures of the perceived acute coronary syndrome of type 2 diabetes clients and their sociodemographic and clinical characteristics.
  
- 3) To explore the correlations between the measures of the perceived acute coronary syndrome and the measures of anxiety and depression symptoms.

### **3. LITERATURE REVIEW**

### 3. LITERATURE REVIEW

Low levels of knowledge of ACS symptoms, and people not being able to recognize symptoms and respond appropriately to symptoms of ACS are global issues (O'Brien et al., 2012). The delay to seek early medical care for symptoms of heart attack results from not knowing the symptoms of heart attack (Awad & Al-Nafisi, 2014).

Further, evidence suggests that knowledge alone is inadequate, since a patient knowing about acute coronary syndrome and its symptoms, is not sufficiently motivating for a patient to seek care early (Pattenden et al., 2002; Dracup et al., 2008). It is also important to consider the psychosocial dimensions such as beliefs, values, emotions and context (Pattenden et al., 2002; Whitaker et al., 2012). However, having adequate knowledge may motivate people to take care of their health (O'Brien et al., 2012; Khayyal, El Geneidy & El Shazly, 2016) and inspire them to take appropriate action when symptoms of heart problems occur (Jensen & Moser, 2008).

Noureddine, Dumit and Maatouk (2020) posited that higher education is no surety for having a great deal of health-related knowledge; therefore, they suggested that clients should be taught the symptoms of and appropriate actions to take, in order to advance the seeking of prompt medical care for heart attack.

In a study of cardiovascular disease in women, the authors found that good attitude did not result in better preventive practice, thus highlighting the need for employing strategies that foster compliance with preventive practices for adequate control of CVDs (Tedesco et al., 2015). Therefore, it has been recommended that education starts at the hospital and continue to be emphasized at every follow-up (Noureddine et al., 2020).

Several studies conducted in lower and middle-income countries have shown correlation between knowledge about health condition and instruction level. In a study carried out with adults in Nepal, Poudel and Sumi (2017) founded that people with low level of instruction reported more barriers to health behaviors than those with high educational level. Other authors, in a quasi-experimental study with Brazilian diabetic individuals, concluded that participants experienced better quality of life after an educational programme (Brito et al., 2016). Further, a study carried out in Bangladesh, among newly diagnosed diabetics, suggests that clients with diabetes have a greater chance of improving self-care practices through education (Saleh et al., 2012).

Other authors investigated the effects of a diabetes self-management education and support, focused on knowledge, attitudes, and self-management practices, adiposity/obesity

and glycaemia in diabetic individuals in Philippines. They concluded that combating diabetes and its adverse effects requires education that will promote behavioral change (Ku & Kegels, 2014). The increase of knowledge of diabetes may contribute to the level of person's confidence in his or her ability to adhere to self-management practices and control the disease (Ku & Kegels, 2014; Amarasekara et al., 2016). Gautam, Bhatta and Aryal (2015), in a study carried out in Nepal, concluded that health promotion for clients with diabetes depends on education.

According to Riegel et al. (2007), knowledge, attitudes, and beliefs of persons with IHD are important predictors of delay in seeking treatment. In general, diabetic individuals fail to engage in self-care activities to control the disease as well as to prevent IHD because of little or no knowledge (Ammouri et al., 2016). Researchers in Egypt found that increased knowledge improves attitudes. They reinforced the importance of educational programs that engage clients and families, and focus on health promotion and secondary prevention of IHD (Seef, Jeppsson & Stafström, 2013). Another study carried out in Nepal, explored the perceptions and experiences of CVD clients regarding their illness, the psychological and social impacts of disease, and adaptive strategies (Oli et al., 2014). The authors suggest that it is important to develop and implement educational programs focused on the prevention of cardiovascular disease and on the misconceptions of cardiovascular health (Oli et al., 2014).

Evidence suggests that policy level efforts to improve the emergency management for persons with acute symptoms of IHD, must be equivalent to the tremendous effort for prevention (Dugani & Gaziano, 2016). Such effort should point at the level of national, international, and individual if the former 50 years of success is to be repeated (Dugani & Gaziano, 2016).

The early control of traditional cardiovascular risk factors benefits clients with short duration of diabetes mellitus and low cardiovascular risk. However, in older adults with high cardiovascular risk and a long duration of diabetes mellitus, with hyperglycemia, there are no benefits (Martín-Timón et al., 2014). Other studies highlighted the importance of screening and cardiac testing for better management of Diabetes in cardiovascular disease prevention (Chiha et al., 2012; Andsoy et al., 2015). According to Andsoy et al. (2015), the strengthening of the healthcare professionals' capacity is relevant for effective patient education towards positive behavioral change and cardiovascular disease prevention.

Through a qualitative study, authors investigated the perceptions of cardiovascular risks in individuals with type 2 diabetes and how their perceptions affect their ability to changes in lifestyle. This study concluded that the misconceptions about diabetes as a risk

factor for IHD resulted in poor self-management behaviors (Carroll et al., 2003). Additionally, Akintunde, Akintunde and Opadijo (2015) found that there is a lack of knowledge about IHD risk factors among University workers in Nigeria and suggested that an educational program focused on these aspects, is important to foster a healthy workforce, and reduce incapacitation. To Vaidya et al. (2013), determining baseline level of health literacy in a community provides insights for health promotion and successful health outcomes.

Evidence suggests that the global burden of NCDs can be reduced by focusing on mental health and well-being (Stein et al., 2019). Anwar, Kuppili and Balhara (2017) noted that depression found in clients with NCDs is a major public health problem, and treatment gaps for depression and different mental health conditions exist all over the world. However, researchers have found that depression, anxiety and other severe mental conditions such as schizophrenia and bipolar disorder occurs alongside the four main NCD (Stein et al., 2019). Further, persons with mental illness were associated with risk factors for NCDs, such as tobacco use, physical inactivity, unhealthy diet and harmful use of alcohol (Stein et al. 2019)

Additionally, in terms of disability-adjusted life-years depression is ranked as the third-leading cause of disability globally (Anwar et al., 2017). Hence, evidence suggests that clients with diabetes who are depressed and anxious are more apt to ignore diabetes self-care recommendations and more likely to pursue sedentary lifestyles, being physically inactive, indulging in smoking and high fat diet, which will ultimately result in poor diabetes control and clinical outcomes (Mukeshimana & Mchunu, 2017).

Approximately 300 million persons suffer from a common mental disorder known as depression. However, the burden of depression is getting greater as more and more persons are becoming depressed globally, owing to the fact that depression can hinder persons' ability to perform in key social settings such as family, work and school (WHO, 2018b).

Evidence from a quantitative study in South Africa revealed that priority is not being given to mental health since it is viewed in isolation of other health needs. In this study, the authors recognized deficits that can be corrected by multi-sectorial collaboration among health, social development and other departments that have clear roles and responsibilities regarding community based psychosocial rehabilitation (Marais, & Petersen, 2015).

### **3.1. Conceptual Model**

In this study, the knowledge, attitudes and beliefs of type 2 diabetes clients toward coronary heart disease and their response to the symptoms of acute coronary syndrome were evaluated by means of The Acute Coronary Syndrome-Response Index. The Acute Coronary

Syndrome - Response Index was developed and validated to assess these aspects in clients with coronary heart disease by Riegel et al. (2007). These authors developed this instrument based on the Leventhal's Self-regulatory Model of Illness Behavior (Leventhal & Cameron, 1987) to understand the factors that affect clients' reactions in response to the Acute Coronary Syndrome (ACS) symptoms which include cognitive and emotional factors.

Leventhal's Commonsense Model of Self-regulation (CSM) clarifies understanding of how people manage chronic conditions in everyday life (Leventhal, Phillips & Burns, 2016). According to the Model, the clients' behaviors, as well as the clients' emotional feelings, associated with the symptoms of the disease, are based on physical experiences that allow clients to identify the symptoms and the mental constructions formed about them. Thus, the clients' representations about the illness and its treatment are generated (Leventhal et al., 2016).

In this perspective, the response to a health threat such as the ACS symptoms is determined by the patient's ability to physically identify/locate symptom, e.g. chest pain, determining its relation to illness and the clients mind set at the time of onset. This ability is affected by knowledge, attitudes, and beliefs. The control of self depends on the knowledge, the fact or comprehension of a reality; the attitudes reflect the mental response, considering something known, and the beliefs and conviction about the truth of a statement without confirmation (Riegel et al., 2007).

## **4. METHODS**

## **4. METHODS**

### **4.1. Design**

This is a cross-sectional study.

### **4.2. Participants**

Participants were identified through the hospital database by reviewing charts of hospitalization and follow-up visits schedules at the out-patient clinic. The data were collected from May 2019 to January 2020 at the Linden Hospital Complex, located in Linden, Guyana. The Linden Hospital Complex includes three hospitals (two district hospitals and one regional hospital). Participants of this study were selected at the Mackenzie Hospital (the regional hospital), that has 115 beds and provides services such as general medicine, general surgeries, obstetrical and gynecology, paediatric and neonatal and at the Upper Demerara Regional Hospital (one of the district hospitals), that provides primarily out-patients' services such as antenatal, chronic disease, and family health clinics.

#### **Inclusion criteria**

The inclusion criteria were adult clients diagnosed with type 2 diabetes 36 months or less, independent of sex and who have cognitive competence (being able to give basic information: their address, current date, and time).

#### **Exclusion Criteria**

The exclusion criteria were persons whose homes could only be accessed by boat, and persons who lived in areas that were inaccessible to public transportation, and individuals for whom the cost to access their homes by other forms of transportation exceeded that of the public transportation costs.

#### **Sampling Procedure**

For this study, the researcher used a convenient sample that was defined from hospitalization records at the Regional Hospital and the outpatient follow-up visits schedules at various health facilities in the Linden community, Region 10. The sample size was delimited by the period to collect the data, which was based on the human and other resources to conduct the study. Participants answered the questionnaires described below:

### **4.3. Measures**

#### **Sociodemographic and clinical data**

A questionnaire was developed to collect sociodemographic and clinical data (Appendix 1), including: date of the interview and birth, sex, marital status, level of education, work status, income per year, time since diabetes diagnosis (in months), weight (Kg) and height (cm); practice of physical activities, medicines, comorbidities, and last clinical exams.

The demographic and clinical data questionnaire was examined in relation to content and face validity. Five health professionals (Register Nurse, Principal Tutor, Midwifery Tutor, Ward sister of the female medical and surgical unit and the Ward sister of the male medical and surgical unit) with expert knowledge in the area of diabetes assessed the instrument considering the objective of this study. The suggestions were used to refine the questionnaire to assure face and content validity (Appendix 2).

#### **Hospital Anxiety and Depression Scale**

The Hospital Anxiety and Depression Scale (HADS) (Attachment 1) developed by Zigmond, and Snaith (1983), was applied to assess symptoms of anxiety and depression. The instrument has 14 multiple-choice questions, with values from zero to three, and covers two domains: anxiety, and depression. Each domain has a possible subscale total of zero to 21, with the larger values representing higher levels of anxiety and depression.

#### **Acute Coronary Syndrome Response Index – ACS-Response Index**

The Acute Coronary Syndrome-Response Index (Attachment 2) was developed to assess Knowledge, Attitudes, and Beliefs about symptoms of ACS and response in the coronary heart disease clients (Riegel et al., 2007). It consists of 33 questions distributed into three subscales that measure Knowledge, Attitudes, and Beliefs (the response to ACS – Response Index). The subscale Knowledge, with 21 dichotomous items, addresses a variety of symptoms related to ACS (15 questions) and unrelated to ACS (six questions - reverse code). One point is attributed to each correct answer and zero for each incorrect. This subscale total score is obtained by adding the correct answers and can vary from 0 to 21. The subscale Attitudes has 5-items (22 to 26) and the subscale Beliefs 7-items (27 to 33). These subscales include questions related to help-seeking in an emergency and respondents' perception of self-confidence in symptom recognition. These two subscales include a Likert-scale with a 4-point response category that ranges from one (not at all) to four (very sure), and from one (strongly agree) to four (strongly disagree), respectively. The Attitudes subscale ranges from

five to 20 and the beliefs subscale from seven to 28. For all subscales, higher scores reflect more positive response to the symptoms of ACS. The ACS–Response Index should be used as an index rather than a scale that assesses observed facts. Thus, it should be used to compare the scores for each subscale (Knowledge, Attitudes, and Beliefs) separately as concepts that influence the answer about ACS. The internal consistency of the original English version was 0.82 for the Knowledge subscale, and 0.76 for both Attitudes and Beliefs subscales (Riegel et al., 2007). The permission to use this instrument was obtained with Dr Barbara Riegel (Appendice 3).

#### **4.4. Procedures**

The researcher visited the outpatient clinic at the Mackenzie Hospital on the scheduled clinic days three times, introduced herself to the clinic staff and the clients, and attempted to identify clients who were eligible for the study. However, there was no eligible clients on those days. This method was not convenient for the principal researcher, considering the available financial and time resources. The principal researcher selected the potential participants from medical records in two Hospitals (the Mackenzie Hospital and the Upper Demerara Regional Hospital). Data were collected according to the schedule of follow-up of clients in medical clinics and their availability.

The hospitals databases were accessed manually on Monday to Friday during working hours from May to December 2019. The data gathered for each client included the name, address, and clinical data such as the time (in months) since the diabetes diagnosis and last clinical exams. The other sociodemographic and clinical data were collected during the interview.

The Guyanese first language is English; however, considering possible cultural differences and to ensure content and face validity, the ACS – Response Index was first tested on 10 clients in three different health facilities. The selection of these ten clients followed the same inclusion and exclusion criteria used in this study; however, they were not included in the final sample.

The instrument was completed by the principal researcher by means of individual face to face interviews. All clients were able to answer each item without making any queries and the feedback received was positive. There was no need for adjustment to the questionnaire.

The data collection was conducted from June, 2019 to January, 2020, based on the clients' availability. Forty clients were interviewed at the outpatient clinic, 15 clients at their

homes, two clients on the streets, and three clients in the market where they work. All questionnaires were completed by the researcher during the interviews.

#### **4.5. Data Analysis**

The data were processed and analyzed using IBM SPSS Statistics for Windows, Version 24.0 (Armonk, NY: IBM Corp.). Descriptive analyses were performed for all variables. The Mann-Whitney test was used to compare the scores of the subscales of the ACS – Response Index with sex (male *versus* female), age (less than 60 years *versus* 60 or more years old), time since diagnosis (less than 12 months *versus* between 12 and 36 months) and body mass index to define not overweight (eutrophic) and overweight (overweight and obesity grade I, II and III) (WHO, 1995).

The Spearman's correlation was used to calculate the correlations between the scores of the ACS – Response Index subscales and the HADS anxiety and depression scores. The Spearman's correlation test was interpreted according to the following levels: values below 0.30 weak, values between 0.30–0.50 moderate and above 0.50 strong (Ajzen & Fishben, 1998).

Comparisons between educational level groups (primary, secondary, university and trade) and the ACS - Response Index subscales were performed using the Kruskal-Wallis for multiple comparisons after the comparisons in pairs or post hoc. The Bonferroni correction test was used to adjust the p-values.

For all tests, significance level was set at 0.05.

#### **4.6. Feasibility**

Feasibility is dependent on the volume of relevant literature, conceptual homogeneity of the study, and completeness of results reporting. The findings from this research are valuable to all health care providers in the health care facilities, especially nurses and physicians. Other stakeholders to benefit from the findings include the Health Care System of Guyana and the Government in order to educate clients diagnosed with type 2 diabetes.

#### **4.7. Ethical Consideration**

The proposal was approved by the IRB (Institutional Review Board) in March, 2019, (Attachment 4), after which a letter was forwarded to the Chief executive officer of the

Linden hospital complex requesting permission to conduct the study through the hospital clinics utilizing patient records. Permission was guaranteed on April 21, 2019 (Appendix 5).

The nature, purpose and conduct of the study were explained to the participants. Participants were informed that privacy and confidentiality were guaranteed. The participants have signed an informed consent (Appendix 4). Only the findings related to the research topic are being published.

The computer that was used by the researchers has a password that can only be accessed by the researcher. Participants were informed that their participation in this research was voluntary and they can withdraw at any time. They were also informed that their participation was valuable to the study. This investigation has minimal risk for the participants.

## **5.RESULTS**

## 5. RESULTS

Out of the 87 eligible clients identified from the hospital records from May to December, 2019, eight no longer resided at the addresses found on their charts; six did not respond to the invitation to participate in the study; five refused to participate; two migrated to other countries; three died and three worked outside of Linden. A total of 60 individuals participated in this study, 39 women and 21 men. The mean age was 55 (S.D.=11.6) years old and varied from 27.9 to 89.8 years old. The participants had completed mainly primary (25; 41.7%) or secondary level of education (26; 43.3%). Only six participants (10%) had graduate degrees. Most of them were married (53.3%) and 53.3% were employed (Table 1).

Table 1 - Socio demographic characteristics of the 60 participants according to sex, age, educational level, marital status, work status and income. Guyana, 2019-2020

<b>Variable</b>	<b>Mean (S.D.*)</b>	<b>Median (range)</b>	<b>N (%)</b>
<b>Sex</b>			
Female			39 (65)
Male			21 (35)
<b>Age (years)</b>	55 (11.6)	54.6 (27.9-89.8)	
<b>Educational level</b>			
Primary			25 (41.7)
Secondary			26 (43.3)
University			6 (10.0)
Trade School			3 (5.0)
<b>Marital status</b>			
Married			32 (53.3)
Divorced			6 (10.0)
Significant person			9 (15.5)
Widow			3 (5.0)
Single			10 (16.7)
<b>Work Status</b>			
Employed			32 (53.3)
Unemployed			14 (23.3)
Retired			10 (16.7)
Disable			4 (6.7)
<b>Income (in GYD)**</b>	5.078,9 (3777,9)	557,00 (557,00-20.000,00)	

\*S.D.=Standard Deviation \*\*GYD=Guyana Dollar

The participants' clinical data are shown in Table 2. The mean time since diabetes diagnosis was 23.6 months (S.D.=8.9) for women and 22.6 months (S.D.=10.8) for men. Most participants reported treating diabetes using prescription medicines (46; 76.6%), an appropriate diet (18; 30%) and herbs (18; 30%). The most frequent comorbidity was hypertension (42; 70%) that was more frequently between men (17; 81.0%) than women (25; 64.1%). The number of clients who reported coronary artery disease was very low (4; 6.7%). Of the 60 participants, 19 is overweight and 35 had some grade of obesity.

Table 2 - Clinical characteristics of the participants, according to sex, type of the diabetes treatment, time since diabetes diagnosis, comorbidities, body mass index, smoking and practice of physical activity. Guyana, 2019-2020

<b>Variable</b>	<b>Total (60) N (%)</b>	<b>Female 39 N (%)</b>	<b>Male (21) N (%)</b>
<b>Type of treatment (yes)</b>			
Prescription medicine	46 (76.6)	31 (79.5)	15 (71.4)
Diet therapy	18 (30)	10 (25.6)	8 (38.1)
Herbal	18 (30)	9 (23.1)	9 (42.9)
<b>Time diabetes diagnosis* (months) Mean (S.D.)**</b>	23.2 (9.5)	23.6 (8.9)	22.6 (10.8)
<b>Comorbidities (yes)</b>	54 (90.0)	34 (87.2)	20 (95.2)
Hypertension	42 (70.0)	25 (64.1)	17 (81.0)
Coronary Artery Disease	4 (6.7)	2 (5.1)	2 (9.5)
Neuropathy	10 (6.7)	7 (17.9)	3 (14.3)
Nephropathy	3 (5.0)	2 (5.1)	1 (4.8)
Retinopathy	20 (33.3)	14 (35.9)	6 (28.6)
<b>Body mass index Mean (S.D.)</b>	31.4 (5.7)	32,1 (6.5)	30.2 (3.5)
Eutrophic (yes)	6 (10)		
Overweight	19 (31.7)		
Obesity I	19 (31.7)		
Obesity II	14 (23.3)		
Obesity III	2 (3.3)		
<b>Smoking* (yes)</b>	9 (15.5)	2 (5.1)	7 (33.3)
<b>Physical activity (yes) N = 60 N (%)</b>	46 (76.7)	15 (32.6)	31(67.3)
Walking	38 (63.3)	28 (60.8)	10 (21.7)
Running	4 (6.7)	2 (4.3)	2 (4.3)
Riding	3 (5)	1 (2.2)	2 (4.3)

\* N=58 participants, \*\* S.D.=Standard deviation

The results of the ACS-Response Index subscale are presented in Tables 3 to 5. Table 3 shows the number of participants who selected correct responses concerning knowledge about ACS symptoms. All 21 items of the Knowledge subscale assess the knowledge of ACS symptoms. The answers are dichotomic, yes or no, and the scores varied from zero to 21. Six of the 21 items are incorrect statements (1. Lower abdominal pain; 3. Arm paralysis; 7. Cough; 9. Headache; 15. Numbness/tingling in arm or hand and 19. Slurred speech). Thus, the answers to these items are reverse coded (Riegel et al., 2007).

As shown in Table 3, the number of clients who answered the items of the Knowledge subscale ranged from 56 to 60. The number of participants that gave the correct answers varied from 12 (item 21. Weakness/fatigue) to 43 (1. Lower abdominal pain and 3. Arm paralysis). Only 25 (43.1%) of the 58 participants responded correctly to item 4, identifying the “back pain” as symptom of acute coronary syndrome. Just three items (1. lower abdominal pain; 3. arm paralysis and 7. Cough) had more than 70% of correct responses. Of these three items, the answer to item “1. lower abdominal pain and 3. arm paralyse are reverse coded. Thus, 43 (72.9%) participants correctly did not recognize this statement as a symptom of acute coronary syndrome.

The number of participants who recognized the main symptoms of acute coronary syndrome (heart attack symptoms) varied from 27.1% to 49.2%, and was distributed as follows: 2. Arm pain or shoulder pain (27; 45%), 5. Chest pain/pressure/tightness (26; 44.1%), 10. Heartburn/indigestion/stomach problem (29, 48.3%), 11. Jaw pain (16; 27.1%), 13. Nausea/vomiting 20 (33.9%), 14. Neck pain (26; 44.8%), 17. Palpitations/rapid heart rate (29; 49.2%) and 20. Sweating (18; 30%).

The total mean score of the Knowledge subscale was 9.12 (S.D.=3.4). Two participants had more than 70% of correct answers.

Table 3 - Descriptive statistics for Knowledge subscale items - Acute Coronary Syndrome – Response Index (N=60). Guyana, 2019-2020

<b>Knowledge subscale</b>		
<b>Items</b>	<b>Participants who correctly answered N (%)</b>	<b>Total N (%)</b>
<b>Total score (Mean; S.D. *)</b>	9.12 (3.4)	
1. Lower abdominal pain (reversed coded)	43 (72.9)	59 (98.3)
2. Arm pain or shoulder pain	27 (45.0)	60 (100)
3. Arm paralysis (reverse coded)	43 (76.8)	56 (93.3)
4. Back pain	25 (43.1)	58 (96.7)
5. Chest pain/pressure/tightness	26 (44.1)	59 (98.3)
6. Chest discomfort (heaviness, burning, tenderness)	23 (38.3)	60 (100)
7. Cough (reverse coded)	40 (71.4)	56 (93.3)
8. Dizziness, lightheadedness	19 (33.3)	57 (95.0)
9. Headache (reverse coded)	31 (52.5)	59 (98.3)
10. Heartburn/indigestion/stomach problem	29 (48.3)	60 (100)
11. Jaw pain	16 (27.1)	59 (98.3)
12. Loss of consciousness/fainting	21 (35.6)	59 (98.3)
13. Nausea/vomiting	20 (33.9)	59 (98.3)
14. Neck pain	26 (44.8)	58 (96.7)
15. Numbness/tingling in arm or hand (reverse coded)	26 (43.3)	60 (100)
16. Pale, ashen, loss/change of color	16 (27.1)	59 (98.3)
17. Palpitations/rapid heart rate	29 (49.2)	59 (98.3)
18. Shortness of breath/difficulty breathing	30 (50.0)	60 (100)
19. Slurred speech (reverse coded)	37(64.9)	57 (95.0)
20. Sweating	18 (30.0)	60 100)
21. Weakness/fatigue	12 (20.3)	59 (98.3)

\*S.D.=Standard deviation

All 60 participants answered the five items of the Attitudes subscale concerning the acute coronary syndrome as shown in Table 4. The item with the highest mean score in this subscale was “How sure are you that you could get help for yourself if you thought you were having a heart attack?” (mean=2.8; S.D.=0.8). This item measures the attitude of help

seeking. The item with the lowest score was “How sure are you that you could recognize the signs and symptoms of a heart attack in someone else?”, (mean=1.8; S.D.=0.9). This item measures the attitude related to the symptom’s recognition. The total mean score of the Attitudes subscale was 11.2 (S.D.=3.5).

Table 4 - Descriptive statistics for Attitudes subscale items - Acute Coronary Syndrome – Response Index (N=60). Guyana, 2019-2020

<b>Attitude</b>	Not at all N (%)	Little sure N (%)	Pretty sure N (%)	Very Sure N (%)	Mean (S.D.*)
<b>Total mean score</b>					11.2 (3.5)
<b>Items</b>					
22. How sure are you that you could recognize the signs and symptoms of a heart attack in someone else?	28 (46.7)	22 (6.7)	6 (10.0)	4 (6.7)	1.8 (0.9)
23. How sure are you that you could recognize the signs and symptoms of a heart attack in yourself?	19 (31.7)	20 (33.3)	18 (30.0)	3 (5.0)	2.0 (0.9)
24. How sure are you that you could tell the difference between the signs or symptoms of a heart attack and other medical problems?	28 (46.7)	8 (13.3)	20 (33.3)	4 (6.7)	2,0 (1.0)
25. How sure are you that you could get help for someone if you thought they were having a heart attack?	8 (13.3)	20 (33.3)	22 (36.7)	10 (16.7)	2.6 (0.9)
26. How sure are you that you could get help for yourself if you thought you were having a heart attack?	3 (5.0)	18 (30.0)	26 (43.3)	13 (21.7)	2.8 (0.8)

\*S.D.=Standard deviation

Table 5 shows the participants’ responses to the items of the Beliefs subscale about the ACS. The total mean score of the Beliefs subscale was 21.3 (S.D.=4.5). The item that has the highest mean score was the “I would be embarrassed to go to the hospital if I thought I was having a heart attack but I wasn’t” (mean=3.2, S.D=0.9). This item was answered by 59 participants and is an item that reflects action. The items with the lowest mean score were the

“Because of the cost of medical care, I would want to be absolutely sure I was having a heart attack before going to the hospital” (mean=1.8; S.D.=0.9) and “If I thought I was having a heart attack, I would go to the hospital right away” (mean=1.7; S.D.=1.0). These items were respectively answered by 58 and 57 participants and reflect expectation.

Table 5 - Descriptive statistics for Beliefs subscale items - Acute Coronary Syndrome – Response Index (N=60). Guyana, 2019-2020

Beliefs	Strongly agree N (%)	Agree N (%)	Disagree N (%)	Strongly disagree (%)	Mean (S.D.*)
<b>Total mean score (S.D.)</b>					21.3 (4.5)
<b>Items</b>					
27. If I have chest pain that doesn't stop after 15 minutes, I should get to the hospital as soon as possible**	7 (11.7)	14 (23.3)	18 (30.0)	21 (35.0)	2.1 (1.0)
28. I would be embarrassed to go to the hospital if I thought I was having a heart attack but I wasn't.	3 (5.1)	9 (15.3)	17 (28.8)	30 (50.8)	3.2 <sup>a</sup> (0.9)
29. If I thought I was having a heart attack, I would wait until I was very sure before going to the hospital.	2 (3.4)	11 (18.6)	19 (32.2)	27 (45.8)	3.2 <sup>a</sup> (0.9)
30. If I thought I was having a heart attack, I would rather have someone drive me to the hospital than have an ambulance come to my home.	8 (13.6)	19 (32.2)	20 (33.9)	12 (20.3)	2.6 <sup>a</sup> (1.0)
31. If I'm having chest pain and I'm not very sure if it's a heart attack, I should go to the hospital**	5 (8.6)	11 (19.0)	27 (46.6)	15 (25.9)	2.1 <sup>b</sup> (0.9)
32. Because of the cost of medical care, I would want to be absolutely sure I was having a heart attack before going to the hospital.	4 (6.9)	5 (8.6)	22 (37.9)	27 (46.6)	1.8 <sup>b</sup> (0.9)
33. If I thought I was having a heart attack, I would go to the hospital right away**	5 (8.8)	10 (17.5)	5 (8.8)	37 (64.9)	1.7 <sup>c</sup> (1.0)

Source: Johnson (2019)

\*S.D.=Standard Deviation; \*\*Reverse code; <sup>a</sup>N=59; <sup>b</sup>N=58; <sup>c</sup>N=57

Table 6 shows the effect of the educational level on the subscales of the ACS-Response Index and total score, using the Kruskal Wallis test for multiple comparisons. This analysis showed that there is an effect of the educational level on the Knowledge ( $p=0.022$ ]

and Attitudes ( $p=0.024$ ] subscales. There is no effect of the educational level on the Beliefs subscale ( $p=0,0820$ ).

Table 6 - Effect of the educational level in the subscales and ACS-Response Index total score according to the Kruskal Wallis test for multiple comparisons. Guyana, 2019-2020

<b>Test statistic*</b>				
	<b>Knowledge</b>	<b>Attitudes</b>	<b>Beliefs</b>	<b>ACS total</b>
<b>Chi-square</b>	9.630	9.416	6.715	4.928
<b>Degrees of Freedom</b>	3	3	3	3
<b>p-value**</b>	0.022	0.024	0.082	0.177

\* Variable for grouping: level of education; \*\*p-value according Kruskal Wallis test

The results of the  $p$  value adjusted according to the Bonferroni correction are showed in Table 7. The comparisons in pairs or post-hoc between the Knowledge and Attitudes subscales and educational levels showed that participants who had university educational level had higher knowledge than those who have primary education ( $p = 0.043$ ). For the Attitudes subscale, the comparisons in pairs showed that there are no significant differences between the measurements of educational levels, when considered the Bonferroni adjustment (Table 7).

Table 7 - Comparisons in pairs or post-hoc between the Knowledge and Attitudes subscales, and educational levels. Guyana, 2019-2020

<b>Educational level</b>	<b>Knowledge</b>	<b>Attitudes</b>
	<b>p value* (adjusted)**</b>	<b>p value* (adjusted)**</b>
<b>Primary and secondary</b>	0,589 (1.000)	0.23 (0.136)
<b>Primary and trade school</b>	0.061 (0.366)	0.028 (0.165)
<b>Primary and university</b>	0.007 (0.043)	0.053 (0.316)
<b>Secondary and trade school</b>	0.127 (0.763)	0.423 (1.000)
<b>Secondary and university</b>	0.024 (0.145)	0.371 (1.000)
<b>Trade school and university</b>	0.799 (1.000)	0.797 (1.000)

\* $p$  value associated to the Kruskal-Wallis test; \*\* $p$  value adjusted according to the Bonferroni correction.

The comparison among the subscales of the ACS-Response Index scores with sex, age, practice of physical activity, time since diagnosis and body mass index is shown in Table

8. The age was categorized in less than 60 years old and 60 years old or more. Of the 60 participants, 41 (68.3%) were less than 60 years old and 19 (31.7%) 60 years old or more. The time since the diagnosis was categorized in less than 12 months—and between 12 and 36 months and the body mass index in not overweight and overweight. There were no significant differences among the score of knowledge and sex, age, practice of physical activity, time since diabetes diagnosis and body mass index. There were no significant differences among the Attitudes and Beliefs subscales concerning sex, practice of physical activity and time since the diabetes diagnosis. The same results were observed between attitudes and age. However, we found that participants who were 60 or more years old showed significant higher scores for Beliefs ( $p=0.01$ ) than those who were less than 60 years old (Table 8).

Table 8 - Comparison of Acute coronary syndrome – Response Index subscales according to sex, age, practice of physical activity, time since diabetes diagnosis, and body mass index. Guyana, 2019-2020

ACS-Response Index* Subscales	Knowledge		Attitude		Beliefs	
	Median (Range)	p***	Median (Range)	p***	Median (Range)	p***
<b>Sex</b>						
Female (n=39)	9.5 (4.0-15.0)	0.66	11.0 (5.0-18.0)	0.85	22.0 (7.0-28.0)	0.27
Male (n=21)	8.0 (4.0-16.0)		12.0 (6.0-16.0)		23.0 (13.0-28.0)	
<b>Age (years)</b>						
< 60 (n=41)	8.0 (4.0-16.0)	0.57	12.0 (5.0-18.0)	0.15	21.0 (7.0-28.0)	0.01
60 or more (n=45)	9.0 (4.0-14.0)		9.0 (5.0-17.0)		23.0 (15.0-27.0)	
<b>Physical activity</b>						
Yes (n=9)	8.0 (4.0-16.0)	0.68	11.0 (5.0-18.0)	0.18	22.0 (7.0-28.0)	0.33
No	11.0 (5.0-12.0)		8.0 (6.0-15.0)		25.0 (13.0-27.0)	
<b>Time since diabetes diagnosis</b>						
Less than 12 months (n=27)	10.0 (4.0-16.0)	0.14	13.0 (5.0-17.0)	0.05	20.0 (13.0-28.0)	0.05
Between 12 and 36 months (n=33)	8.0 (4.0-14.0)		10.0 (5.0-18.0)		23.0 (7.0-28.0)	
<b>BMI**</b>						
Not overweight (n=6)	8.0 (5.0-17.0)	0.65	8.5 (6.0-15.0)	0.40	21.5 (16.0-27.0)	0.97
Overweight (n=44)	9.0 (4.0-16.0)		12.0 (5.0-18.0)		22.0 (7.0-28.0)	

\* ACS-Response Index=Acute Coronary Syndrome Response Index; \*\*BMI=Body mass index; \*\*\*p valor associated to the Mann-Whitney test.

Table 9 shows the Spearman's correlation between the score of the ACS – Response Index subscales (Knowledge, Attitudes and Beliefs) and the symptoms of anxiety and depression scores using HADS. The results showed significant positive and strong correlation between the Knowledge subscale of the ACS-Response Index with Attitudes ( $r=0.60$ ;  $p<0.001$ ) and positive and weak with Beliefs, but not significant ( $r=0.07$ ;  $p=0.66$ ).

Strong and positive correlation was found between Knowledge and symptoms of depression, but not significant ( $r=0.63$ ;  $p=0.67$ ). The correlation between Attitudes and Beliefs was negative, weak and not significant. The correlation between symptoms of anxiety and beliefs was significant, negative, and strong ( $r=-0.53$ ;  $p<0.001$ ) (Table 9).

Table 9 - Spearman's correlation between the scores of the ACS – Response Index subscales (Knowledge, Attitude and Beliefs) and the anxiety and depression scores. Guyana, 2019-2020

Variables	Mean (S.D.*)	Median (range)	ACS** subscales		
			Knowledge <i>R (p)</i>	Attitudes <i>r (p)</i>	Beliefs <i>r (p)</i>
<b>ACS Response Index subscales**</b>					
Knowledge	9.1 (3.4)	9.0 (4.0-16.0)	-	0.60 (<0.001)	0.07 (0.66)
Attitude	11.2 (3.5)	11.5 (5.0-18.0)	-	-	-0.16 (0.25)
Beliefs	21.3 (4.5)	22.0 (7.0-28.0)	-	-	-
<b>HADS***</b>					
Anxiety N=56	6.3 (5.0)	5.0 (0-20)	0.01 (0.90)	0.16 (0.22)	-0.53 (<0.001)
Depression N=60	5.8 (4.4)	5.0 (0-19)	0.63 (0.67)	0.21 (0.10)	-0.24 (0.08)

\*S.D.=Standard deviation; \*\* ACS-Response Index=Acute Coronary Syndrome Response Index;

\*\*\*HADS=Hospital Anxiety and Depression Scale

## **6. DISCUSSION**

## 6. DISCUSSION

The main objective of this study was to evaluate the level of Knowledge, Attitudes, and Beliefs of type 2 diabetes clients regarding the ACS symptoms. We also explored the association between the perceived ACS measures and participants' sociodemographic and clinical characteristics and the correlations between the measures of the perceived ACS and the measures of anxiety and depression symptoms. Our results support other authors findings about the lack of knowledge among people who are at high risk for heart attack (O'Brien et al., 2012; Nouredine et al., 2020). However, participants of our study showed lower mean score of knowledge than participants of other studies carried out in Ireland (O'Brien et al., 2012) and in Jordan (Alfasfos et al., 2016), that found, respectively, a mean score of 17.8 (S.D.=3.6) and 16 (S.D.=3.6).

Differently to other authors (Alfasfos et al., 2016), who found 35% of participants with more than 70% of correct answers in the Knowledge subscale, in our study, only two participants had more than 70% of correct answers. This value was adopted as a cut-off point by other authors to indicate an adequate result in the ACS - Response Index knowledge subscale (Dracup et al., 2008; O'Brien et al., 2012). The difference in these results may be due to the characteristics of the sample, since the participants of previous studies could have referred to their experience considering their history of the ACS, which was not the same for most of the participants in our study. Another reason may be related to the level of education, since 25 (41.7%) participants of our study had primary level of education, which can represent a challenge for health education. Other authors found similar results for the total mean score in the Attitudes subscale (11.5; S.D=3.0) in relation to that found in our study. However, they found higher mean score (24.7; S.D.=4.6) in the Beliefs subscale when compared to our results (Alfasfos et al., 2016)

In our study, the analysis of the knowledge regarding ACS of clients with type 2 diabetes revealed that a smaller percentage was able to recognize the most typical symptom of this syndrome, the chest pain. In a study conducted in Nepal, 60% of the sample was unable to identify a single symptom (Vaidya et al., 2013). Other authors found chest pain as a symptom with the highest score (Whitaker et al., 2012; O'Brien et al., 2012; Awad & Al-Nafisi, 2014; Albarqouni et al., 2016; Alfasfos et al., 2016; Nouredine et al., 2020); however, in our study, the item "heartburn/indigestion/stomach problems" was the symptom most identified. These results may be related to the fact that customers responded to the symptoms they experienced in their life. Often adults may confuse pain in the sternum area with pain in the stomach.

The answers of the participants of our study to the Attitudes subscale reflect the lack of knowledge about the symptoms of ACS and its differentiation. These findings may be due to customers' lack of interest in coronary artery disease, as they probably never thought that having type 2 diabetes would put them at high risk for heart attack. In our study, the items with the highest average score on the Attitudes subscale are "How sure are you that you could get help for someone if you thought s/he was having a heart attack?" and "How sure are you that you could get help for yourself if you thought you were having a heart attack?" These items reflect the action of seeking help; however, to have this type of attitude, it is necessary to first recognize the symptoms. In our study, items that reflect the symptom recognition attitude (Riegel et al., 2007) had the lowest mean score.

According to other authors, psychosocial dimensions are important to help seeking (Pattenden et al., 2002; Riegel et al., 2007; Whitaker et al., 2012). Further examination of the Attitudes subscale found that participants were more positive about their ability to get help for themselves if they had suffered a heart attack, than for others, which is similar to studies in Lebanon (Noureddine et al., 2020) and Jordan (Alfasfos et al., 2016). In this study, recognizing heart attack symptoms in someone else had the lowest mean score, which is similar with the findings of other authors (Alfasfos et al., 2016).

The item of the Beliefs subscale that had the highest score in previous studies was "If I have chest pain that doesn't stop after 15 minutes, I should get to the hospital as soon as possible". More than 90% of participants in other studies believed that they should get to the hospital as soon as possible (O'Brien et al., 2012, Cao et al., 2012). However, in our study, for that item, we found the opposite. The majority of participants did not believe that they should get to the hospital as soon as possible for chest pain that last longer than 15 minutes. One explanation could be that clients did not perceive chest pain as a life-threatening event. The item that shows how quickly a clients would go to the hospital in the face of a cardiac event had a lower average score, showing that there could be a delay in reaching the hospital if they thought they was having a heart attack, differently from the results of other studies (Cao et al., 2012).

The item with the lowest mean score noted that clients do not believe they would go to the hospital right away if they thought they were having a heart attack ("If I thought I was having a heart attack, I would go to the hospital right away"), which is contrasting to the findings of Cao et al. (2012).

The item with the highest mean score, in the Beliefs subscale was "I would be embarrassed to go to the hospital if I thought I was having a heart attack, but I wasn't". This

result can be explained by the lack of knowledge about risk factors for ACS and about the severity of it. In addition, in Guyana, the elderly often refers to the sternum region as the stomach. Thus, socio-cultural aspects can also influence the interpretation and the response to the ACS (Osokpo & Riegel, 2019). Thus, whenever they feel pain in that region, it is usually interpreted as “wind pain” or presence of gases. In this case, in Guyana, people often resort to drinking hot drinks like garlic tea or anise or ginger tea to burp in an attempt to relieve pain. Sociocultural aspects can also influence the interpretation and response to the ACS (Osokpo & Riegel, 2019). The delay in seek treatment of acute myocardial infarction contributes to increase the mortality. The initiative to seek the emergency service in face of acute myocardial heart attack depends on knowledge about the symptoms and the patient responses (Noureddine et al., 2020).

The results of our study showed an effect of the educational level on the knowledge. It was found that participants who had university level had better knowledge in comparison with those who had had primary educational level. Findings from other studies have shown that inadequate knowledge was attributed to low level of education (Alfasfos et al., 2016). In our study, there was no significant effect on the level of education on the Attitudes and Beliefs subscales. It is possible that participants with lower level of education have difficulties to understand the items of the ACS - Response Index, which is reinforced by the number of items that have not been answered.

Several researches have shown that women had more knowledge of cardiovascular disease than men (Awad & Al-Nafisi, 2014; Andsoy et al., 2015), but the opposite was found in the study among Jordanian clients (Alfasfos et al., 2016). We did not find any significant knowledge difference between males and females in this study, which is similar to the findings of a study carried out in Nigeria to assess knowledge of heart disease risk factors (Akintunde et al., 2015). In a literature review, about levels of knowledge of symptoms and risk factors of heart disease, the authors concluded that there were no differences between women and men; both had low knowledge about ACS (Jensen & Moser, 2008).

Participants of our study who were 60 years old or more had statically significant higher score in the Beliefs subscale than those who were less than 60 years old ( $p=0.01$ ). However, there are not statically significant differences between these age groups concerning the Knowledge and Attitudes subscales. Other authors found that older adults had lower scores in the Knowledge (Dracup et al., 2008) and Attitude subscales (Noureddine et al., 2020) compared with younger client.

We did not find significant differences in knowledge between clients who reported some physical activity and participants who did not report it ( $p=0.68$ ). The same was observed between attitudes and beliefs and physical activity. These results are consistent with the number of participants who were overweight in our study.

In our study, we included clients with time since diabetes diagnosis of 36 months or less, in order to contribute to development of educational interventions focused on type 2 diabetic clients' awareness of their cardiovascular risks. Our results showed that there is no statistically significant difference between time since diabetes diagnosis, less than 12 months and between 12 and 36 months, and the ACS – Response – Index subscales. However, we observed that, clients who had less than 12 months since the diabetes diagnosis, showed more positive Attitudes ( $p=0,05$ ). The opposite was observed for the Beliefs subscale. Participants with between 12 and 36 months since the diabetes diagnosis showed higher level of beliefs than participants with less than 12 months, although the difference is not statistically significant. This aspect needs to be investigated in further studies, since diabetes is a major factor for development of coronary artery disease (Liu et al., 2017).

The significant positive and strong correlation between Knowledge and Attitudes subscales ( $r=0.60$ ;  $p<0.001$ ) is congruent with the concepts that underline both constructs, that clients who have more knowledge about the ACS have more positive attitudes concerning the response to the coronary event. This result is very relevant, considering that we included in our study clients diagnosed with type 2 diabetes and 58.3% of participants had some degree of obesity and 90% reported other diseases, especially hypertension (70%). It is known that the presence of comorbidities increases the risk of myocardial infarction and heart failure (Liu et al., 2017). Our result reinforces the lack of knowledge about the ACS in this population (Liu et al., 2017) and the importance to increase the educational programs focused on this syndrome, its risk factors and treatment. According to Alfasfos et al. (2016), the communication between clients and health professionals can lead to improvement in their attitudes and beliefs concerning the risk of having a heart attack.

The significant, strong and negative correlation between symptoms of anxiety and beliefs ( $r=-0.53$ ;  $p<0.001$ ) showed that clients who had more symptoms of anxiety had lower mean scores of beliefs concerning the response to the ACS. The correlations between anxiety and Knowledge, and between anxiety and Attitudes were weak. Other authors (McKinley et al., 2009) found that higher levels of anxiety state were associated with lower levels in the three ACS - Response Index subscales (Knowledge, Attitudes and Beliefs).

We found that the correlations between the symptoms of depression and the Knowledge subscale is strong, but not significant. The correlations between depression and the Attitudes and Beliefs subscales were weak. Other authors showed that diabetic clients who were depressed and anxious have poor adherence with the lifestyle changes; are sedentary, physically inactive, indulgent in smoking and do not follow the recommended diet (Mukeshimana & Mchunu, 2017). This result can be explained by the fact that participants of our study had the mean score for symptoms of anxiety (6.3; S.D.=5.0) and depression (5.8; S.D.=4.4) which is lower than eight, the cutoff point suggested by the literature (Snaith, 2003).

One limitation of this study is the small sample size that may have influenced the results; therefore, they cannot be generalized. The lack of records about data on results of clinical subsidiary exams that could confirm the reported comorbidities is another limitation of the present investigation. Our results can be influenced by the number of questions not responded by participants.

## **7. CONCLUSION AND IMPLICATIONS FOR NURSING PRACTICE**

## 7. CONCLUSIONS AND IMPLICATIONS FOR NURSING PRACTICE

Patients with type 2 diabetes, participants of this study, showed low level of knowledge concerning ACS. Only two participants of our study had more than 70% of correct answer and less than half of the participants reported chest pain as heart attack typical symptom. We also found that the higher level of knowledge about the ACS had strong and positive correlation with the positive attitudes concerning the response to the coronary event.

The results showed that clients who were 60 years old or more had significant higher mean scores for beliefs than those who were less than 60 years old. However, no significant differences were found between other socio demographic and clinical characteristics and the subscales of the ACS-response index. The results of this study showed an effect of the educational level on the knowledge.

We found significant, strong and negative correlation between symptoms of anxiety and beliefs concerning the response to the ACS. The correlations between symptoms of depression and the Knowledge subscale is strong, but not significant. The correlations between depression and the Attitudes and Beliefs subscales were weak.

The results of this study highlight to policy makers and health professionals, the deficit of knowledge of clients with type 2 diabetes regarding ACS and the lack of attitude towards a heart attack. Knowledge of the risks of heart disease improves clients' ability to identify the signs and symptoms of acute myocardial infarction. Therefore, in addition to the dissemination of information about CHD and ACS through various means of communication, health professionals can organize scheduled visits to different places in the community, including workplaces, conducting informative discussions in an effort to increase knowledge, and allowing people to have access to reliable information. Further, the results of this study make it possible for the development of nursing care plans and improving utilization in service delivery. It is suggested that nurses and individuals who teach courses about NCDs, should place more emphasis on building effective nursing care plans that reflect patient education, with the aim of increasing the clients' ability to recognize the symptoms of ACS and answer correctly.

Moreover, when nurses and students develop and implement nursing care plans that are individualized and focus on preventive health care, clients will learn more about their condition and risks, and are more likely to have better attitudes in response to symptoms of heart attack. Thus, we expect that clients will practice healthy living as a way of life.

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**APPENDICE 1****QUESTIONNAIRE OF DEMOGRAPHIC AND CLINICAL DATA**

ID: \_\_\_\_\_ Date of interview: \_\_/\_\_/\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_

Phone:

Sex: Female ( ) Male ( )

Date of Birth: \_\_/\_\_/\_\_

( ) Married ( ) Divorced ( ) Significant person living together ( ) Widow ( ) Single

Level of Education: ( ) Primary ( ) Secondary ( ) University ( ) Trade school

Work Status: ( ) Employed ( ) Unemployed ( ) Retired ( ) Disabled

Monthly income \_\_\_\_\_ (GYS) \_\_\_\_\_ (American Dollar)

How long have you been diagnosed with diabetes? \_\_\_\_\_ months

Treatment ( ) Prescription medicine ( ) Diet ( ) Herbal

Physical activities: \_\_\_\_\_ (specify)

Medications:

Name	Dose

Are you using medication for any of the following:

Depression ( ) Yes ( ) No Anxiety ( ) Yes ( ) No Sleep ( ) Yes ( ) No

Please specify name of drug and dose \_\_\_\_\_

Comorbidities

Hypertension: ( )

Coronary artery disease ( )

Heart failure ( ) Nephropathy ( ) Retinopathy ( ) Neuropathy ( )

Dyslipidemias (Last exams in \_\_/\_\_/\_\_) LDL: \_\_\_\_\_ HDL: \_\_\_\_\_ Triglycerides: \_\_\_\_\_

Other \_\_\_\_\_  
\_\_\_\_\_

Weight: \_\_\_\_ Kg; Height: \_\_\_\_ cm Body mass index \_\_\_\_\_

Smoker ( ) Yes ( ) No      Number of cigarettes/day

Time since stop smoking (in years) \_\_\_\_\_

## APPENDICE 2

Five health professionals who are senior nursing staff with expert knowledge in the area of diabetes assessed the instrument considering the objective of this study. These personnel were from the Charles Roza School of Nursing and the Linden Hospital complex, and comprised the principal nursing tutor, one midwifery tutor, one registered nurse with less than five years of experience, ward sister of the male medical and surgical unit and ward sister of the female medical, surgical and gynaecology unit.

Observation: justify

Suggestions for change in some items of the questionnaire were made because the items were not clear taking cultural language into consideration. Changes are outside the brackets while the original items are in the brackets marital status: common law was suggested but was not used since it only spans a male female relationship hence, significant persons living together was used as is on the questionnaire, level of education (level of instruction in years), monthly income (income per year), treatment: ( ) prescription medicine ( ) diet ( ) Herbal ( [ ] medicine [ ] diet) are you using medication for ( ) depression ( ) anxiety ( ) sleep (medicine for: [ ] depression [ ] anxiety [ ] sleep), work status: ( ) employed ( ) unemployed ( ) retired ( ) disabled ([ ] working [ ] retired [ ] housewife). Added to the list of co-morbidities was neuropathy. the adjustments made on the demographic and clinical data questionnaire resulted in the development of a new demographic and clinical data questionnaire.

**APPENDICE 3**

Dear Dr. Riegel

I am a Master student at University of São Paulo Ribeirão Preto College of Nursing, and I would like to use The Acute Coronary Syndrome Response Index to assess the knowledge, attitudes, and beliefs toward symptoms of acute coronary syndrome and response in the patients with Diabetes, developed by your group (Riegel et al. 2007. Res Nurs Health. 2007 Dec;30(6):584-94). I intend to use it in Guyana, where the population is English speaking. Could you please, give me the permission to use it and if you agree, could you send me the original form?

Respectfully

Camille Hunte-Johnson

**From:** Riegel, Barbara <briegel@nursing.upenn.edu>

**To:** Camille Johnson <jcamille75@yahoo.com>

**Sent:** Monday, October 1, 2018, 10:42:14 AM GMT-3

**Subject:** RE: Usage of your Tool

Hello Camille, you are welcome to use the instrument. Unfortunately, I don't have the original form any longer but you can take the items out of the publication. Good luck with your project.

Barbara Riegel, PhD, RN, FAHA, FAAN

Professor and Edith Clemmer Steinbright Chair of Gerontology

University of Pennsylvania, School of Nursing

Claire M. Fagin Hall, 418 Curie Boulevard

Philadelphia, PA 19104-4217

[briegel@nursing.upenn.edu](mailto:briegel@nursing.upenn.edu)

215-898-9927 Phone

240-282-7707 eFax

**APPENDICE 4****Free and Informed Consent Form****IRB (Intuitional Review Board), Ministry of Public Health (MoPH), Guyana****Responsible researcher:** Camille Hunte Johnson**Research Project: Knowledge, attitudes and beliefs of type 2 diabetes clients toward coronary heart disease and their response to symptoms of acute coronary syndrome.**

Mr/Miss/Mrs \_\_\_\_\_ I am inviting you to participate in a research project, which the objectives are to evaluate the knowledge attitudes and beliefs that you have toward coronary heart disease and your response to symptoms of angina/chest pain. If you agree, I will ask you to answer three questionnaires. You will take more or less thirty minutes. I will complete the forms according to your answer. If you do not want to participate, there will be no changes in your treatment and you may not answer any questions that cause embarrassment. You will be offered all the clarifications about the research in any aspect that you wish. You are free to stop participating at any time and you will not be identified at any time. Participation in the study will not incur costs for you, will not offer risky and you will not receive any financial compensation. If you need to return to the out-patient clinic outside the routine, a cost aid will be granted with the public transportation so that you can come. In case of doubts you call me

I

Mr/Miss/Mrs \_\_\_\_\_ ID \_\_\_\_\_

\_\_\_\_\_ I was informed of the above research objectives in a clear and detailed manner and my doubts were clarified. I know that at any time I may request new information and modify my decision if I so desire. The researcher in charge has made sure that all the data of this research will be confidential. I also know that if there are additional expenses, these will be absorbed by the research budget. I declare that I agree to participate in this study. I received a copy of this free and informed consent form and was given the opportunity to read and clarify my doubts

Patient Signature:

\_\_\_\_\_ Data: \_\_\_\_\_

**Responsible researcher:** Camille Hunte Johnson \_\_\_\_\_

Phone number \_\_\_\_\_

APPENDICE 5

1308 Central  
Amelia's Ward  
Linden  
2019-

The Chief Executive officer  
Linden Hospital Complex  
Riverside Drive Watooka  
Mackenzie, Linden

Dear Sir,

Re: permission to conduct research study at the Hospital and to access Patient charts

I, Camille Hunte Johnson, principle investigator and Master's student of University of São Paulo  
Ribeirão Preto College of Nursing, hereby requesting permission to conduct a study on the  
grounds of the hospital and requires access to patient records.

The title of the study is: **Knowledge, attitude and beliefs of type 2 diabetes clients toward  
coronary heart disease and their response to symptoms of acute coronary syndrome.**

The researchers request access to the following:

Access to the clinical files and record book

Interacting with patients at the medical clinic

I intend to protect the personal identity of the patients by assigning each patient a random code number.

I undertake not to proceed with the study until I have received approval from the IRB/ Review Ethics  
Committee, Ministry of Public Health.

*Attn: Mr. Robert...*  
*No objection.*  
*Dr. David...*  
*29/07/19*  
*...*

Yours sincerely,

Camille Hunte Johnson  
Camille Hunte Johnson

**ATTACHMENTS**

## ATTACHMENT 1

## Hospital Anxiety and Depression Scale (HADS)

Tick the box beside the reply that is closest to how you have been feeling in the past week. Don't take too long over you replies: your immediate is best.

	D	A		D	A
I feel tense or 'wound up':			I feel as if I am slowed down:		
Most of the time		3	Nearly all the time	3	
A lot of times		2	Very often	2	
From time to time/ occasionally		1	Sometime	1	
Not at all		0	Not at all	0	
<b>I still enjoy the things I used to enjoy:</b>			<b>I get sort of frightened feeling like 'butterflies' in the stomach:</b>		
Definitely as much	0		Not at all		0
Not quite so much	1		Occasionally		1
Only a little	2		Quite often		2
Hardly at all	3		Very often		3
<b>I get a sort of frightened feeling as if something awful is about to happen:</b>			<b>I have lost interest in my appearance:</b>		
Very definitely and quite badly		3	Definitely	3	
Yes, but not too badly		2	I don't take as much care as I should	2	
A little but it doesn't worry me		1	I may not take as much care as I should	1	
Not at all		0	I just take as much care as ever	0	
<b>I can laugh and see the funny side of things:</b>			<b>I feel restless as I have to be on the move:</b>		
As much as I always could	0		Very much indeed		3
Not quite so much now	1		Quite a lot		2
Definitely not so much now	2		Not very much		1
Not at all	3		Not at all		0
<b>Worrying thoughts go through my mind:</b>			<b>I look forward with excitement to things:</b>		
A great deal of the time		3	As much as I ever did	0	
A lot of the time		2	Rather less than I used to	1	
From time to time, but not too		1	Definitely less than I used to	2	

often				
Only occasionally		0	Hardly at all	3
<b>I feel cheerful:</b>			<b>I get sudden feeling of panic:</b>	
Not at all	3		Very often indeed	3
Not often	2		Quite often	2
Sometime	1		Not very often	1
Most of the time	0		Not at all	0
<b>I can sit at ease and feel relaxed:</b>			<b>I can enjoy a good book or radio or TV program:</b>	
Definitely		0	Often	0
Usually		1	Sometimes	1
Not often		2	Not often	2
Not at all		3	Seldom	3

Please check you have answered all the questions

Scoring: Total score: Depression (D) \_\_\_\_\_ Anxiety (A) \_\_\_\_\_

0-7 = Normal

8-10 = Borderline abnormal (borderline case)

11-21 = Abnormal (case)

## ATTACHMENT 2

### Acute Coronary Syndrome (ACS) Response Index

This questionnaire asks about your health and your perceptions about heart attack symptoms. The study investigators would be grateful if you would answer all of the questions in each section.

**Knowledge subscale.** Please circle “0” if you think the symptom is not a symptom of a heart attack or ‘1’ if you think the symptom is a symptom of heart attack.

No.	Knowledge	No	Yes
1	Lower abdominal pain (reverse coded)	0	1
2	Arm pain or shoulder pain	0	1
3	Arm paralysis (reverse coded)	0	1
4	Back pain	0	1
5	Chest pain/pressure/tightness	0	1
6	Chest discomfort (heaviness, burning, tenderness)	0	1
7	Cough (reverse coded)	0	1
8	Dizziness, lightheadedness	0	1
9	Headache (reverse coded)	0	1
10	Heartburn/indigestion/stomach problem	0	1
11	Jaw pain	0	1
12	Loss of consciousness/fainting	0	1
13	Nausea/vomiting	0	1
14	Neck pain	0	1
15	Numbness/tingling in arm or hand (reverse coded)	0	1
16	Pale, ashen, loss/change of color	0	1
17	Palpitations/rapid heart rate	0	1
18	Shortness of breath/difficulty breathing	0	1
19	Slurred speech (reverse coded)	0	1
20	Sweating	0	1
21	Weakness/fatigue	0	1

**Attitudes Subscale.** Next are some questions about some statements of attitude. Please circle “1” for not at all, “2” for a little sure, “3” for pretty sure, and “4” for very sure.

No.	Attitudes	Not at all	Little sure	Pretty sure	Very sure
22	How sure are you that you could recognize the signs and symptoms of a heart attack in someone else?	1	2	3	4
23	How sure are you that you could recognize the signs and symptoms of a heart attack in yourself?	1	2	3	4
24	How sure are you that you could tell the difference between the signs or symptoms of a heart attack and other medical problems?	1	2	3	4
25	How sure are you that you could get help for someone if you thought they were having a heart attack?	1	2	3	4
26	How sure are you that you could get help for yourself if you thought you were having a heart attack?	1	2	3	4

**Beliefs subscale.** Next are some questions about some statements of opinions. Please circle “1” for strongly agree, “2” for agree, “3” for disagree, and “4” for strongly disagree.

No.	Beliefs	Strongly agree	Agree	Disagree	Strongly disagree
27	If I have chest pain that doesn't stop after 15 minutes, I should get to the hospital as soon as possible (reverse coded)	4	3	2	1
28	I would be embarrassed to go to the hospital if I thought I was having a heart attack but I wasn't.	1	2	3	4
29	If I thought I was having a heart attack, I would wait until I was very sure before going to the hospital.	1	2	3	4
30	If I thought I was having a heart attack, I would rather have someone drive me to the hospital than have an ambulance come to my home.	1	2	3	4

31	If I'm having chest pain and I'm not very sure if it's a heart attack, I should go to the hospital (reverse coded).	4	3	2	1
32	Because of the cost of medical care, I would want to be absolutely sure I was having a heart attack before going to the hospital.	1	2	3	4
33	If I thought I was having a heart attack, I would go to the hospital right away (reverse coded).	4	3	2	1

**ATTACHMENT 3**

1

**Ministry of Health****Guyana****Project Proposal Form  
Ethical Review Committee****1. Title of Project:****Knowledge, attitude and beliefs of type 2 diabetes clients toward coronary heart disease and their response to symptoms of acute coronary syndrome.****2. Investigators:**

Primary investigator (PI): Camille Hunte-Johnson

**Tel No:** 617- 3083**Collaborator/Advisor****Name:** Prof. Dr. Lidia Aparecida Rossi **Tel no.** \_\_\_\_\_**3. Expected dates of:**

Sample collection field work will be from January 2019 to July 2019.

**Lab analysis:** will be in October 2019

Write up will be in March 2020 – October 2020

Writing final results/thesis/publication will be in October 2020

**4. Purpose and objective of project.**

To evaluate the knowledge attitude and beliefs of type 2 Diabetes clients toward coronary heart disease and their response to symptoms of acute coronary syndrome.

In doing so, the following will be address:

1. Assess the level knowledge type 2 Diabetes clients have on coronary heart disease;
2. Identify the attitude of clients with type 2 Diabetes towards symptoms of acute coronary syndrome;
3. Assess the clients with type 2 Diabetes perception of coronary heart disease.

**5. How many subjects will be used?**

The study comprises of at least 70 adult clients with type 2 Diabetes previously admitted to the Linden Hospital Complex.

**6. Who are being recruited and what are the criteria for their selection?**

The study comprises all adult clients diagnosed with type 2 Diabetes twenty-four months or less and must have cognitive competence, independent of sex, being able to give basic information like current date and time and their address.

**7. How are subjects being recruited? If with written materials, attach a copy. If verbally state exactly what they will be told, by whom, and when and where this will occur.**

Potential participants will be identified through the hospital database by reviewing charts of hospitalization and follow-up visit schedules at the out-patient clinic. The investigator will visit the follow-up medical out-patient clinic of the Linden Hospital Complex, region # 10, to have initial contact with prospective participants. Participants who fit the inclusion criteria will be informed of the nature and conduct of the study. A written document of the consent form will be used for this purpose (Appendix 2).

**8. Describe the study methodology and procedures. Include details of all medical devices or tests, interviews, questionnaires, or use of medical records.**

The researcher intends to use a cross sectional study with prospective comparative descriptive design that consists in a single interview of participants. The data will be collected from January 2019 to July 2019 at the Linden Hospital Complex.

**9. What is known about the risks and benefits of the proposed research? Do you have any additional opinions on this issue?**

The study has minimal risk and no financial benefits for the participants. Evidence will be available on the Knowledge, attitude and beliefs of type 2 diabetes clients toward coronary heart disease and their response to symptoms of acute coronary syndrome.

**10. What discomfort or incapacity are subjects likely to endure as a result of their participation?**

The sensitive nature of the study requires participants to provide personal information which may make them uncomfortable, thus affecting the credibility of their responses.

**11. What provisions are made to protect confidentiality? Who has access to coded and encoded data?**

All data collected will be stored safely in locked cupboards. Computers with password only accessible to the researcher will be needed for data storage. Data will be grouped together so that it cannot be linked to any participant. Questionnaires will be stored in locked cabinets allowing only the researcher to have access. No data regarding the identification of the participants will be noted in the questionnaire. The reports of the student will not expose any information which can identify the participants.

**12. How much time will a subject have to dedicate to participating?**

The participants will have 30 minutes to fill out the questionnaire.

**13. What are plans for future use of data or samples, beyond what is already described?**

Data will be stored in confidence. However, if the need arises for the future use of the data the stakeholders, MOPH, IRB will be summoned for permission.

**14. How will informed consent be obtained? If by written forms, please attach copies. If informed consent will be verbal, state that will be involved and provide a written statement of information that will be given to subjects, and to nurses or other intermediaries.**

The nature, purpose and procedure of the study will be explained to the participants and all their queries will be answered. They will be told that their participation is completely voluntary. If they refuse to participate there will be no penalty attached, they are free to withdraw from the study at any time. They will also be told that they can refuse to answer any question on the questionnaire. Those who agree to these conditions will be provided with a written document (Appendix 2).

**15. Do you agree to provide a statement of significant findings (not more than one page in laypersons terms) to the MOH Committee when writing your paper/thesis, and to copy such information to participants who request it?**

This report will be provided to the Ministry of Public Health.

**16. If the study is a part of your requirement for training, list the members of your supervisory committee and their affiliated institutions:**

The research is supervised by **Advisor:** Prof. Dr. Lidia Aparecida Rossi

University of São Paulo Ribeirão Preto College of Nursing.

**17. I certify that this statement is true. I agree to submit any subsequent changes in study design that bear on living subjects to the IRB for review. I will report to the IRB any concerns brought to me by the study participants about their roles or treatment in the project.**

Signed: \_\_\_\_\_ Date \_\_\_\_\_

(Principle Investigator)



Date January 11<sup>th</sup>, 2019

(Supervisor)

Please submit completed forms along with seven (7) copies of the Study Proposal and other relevant documents to:

*Dr. Shamdeo Persaud, CMO  
Chairman, IRB/Ethical Review Committee  
Ministry of Health, Guyana  
Lot 1 Brickdam, Stabroek  
GEORGETOWN  
Guyana  
Tel: 592 226 1224  
Fax 592 225 6271*

E-mail: [cmoguyana@gmail.com](mailto:cmoguyana@gmail.com) or [cmo@health.gov.gy](mailto:cmo@health.gov.gy)

## ATTACHMENT 4

**Institutional Review Board FWA00014641**  
**Ministry of Public Health**  
**Brickdam, Georgetown, GUYANA**  
 Telephone: 592-22-61224  
 e-mail: cmoguyana@gmail.com/cmo@health.gov.gy

### Memo

**To:** Camille Hunte-Johnson  
**From:** The Chairman, IRB Ministry of Health  
**Date:** 11/02/2019  
**Re:** IRB Approval of New Protocol # 508/2019

The Ministry of Public Health's IRB has reviewed the request for approval of protocol # **508/2019** entitled "**Knowledge, attitude & beliefs of Type 2 Diabetes clients toward coronary heart disease & their response to symptoms of acute syndrome**" and has approved the protocol for the maximum allowable period of **one year**. This IRB approval expires **January, 2020**.

As a reminder, the IRB must review and approve all human subjects' research protocols at intervals appropriate to the degree of risk, but not less than once per year. There is no grace period beyond one year from the last IRB approval date. It is ultimately your responsibility to submit your research protocol for continuation review and approval by the IRB. Please keep this approval in your protocol files as proof of IRB approval and as a reminder of the expiration date. To avoid lapses in approval of your research and the possible suspension of subject enrollment and/or termination of the protocol please submit your continuance request at least six weeks before the protocol expiration date.

Upon completion of your research a Report <sup>CHJ</sup> **MUST** be submitted to the Board.

Any problems of a serious nature should be brought to the immediate attention of the IRB and any proposed changes to the protocol should be submitted as an amendment to the protocol for IRB approval before they are implemented.

If you have any questions please contact the **IRB Administrator** or the **IRB Chairman** on **226-1224**.


  
 Chief Medical Officer  
 Dr. Shamdeo Persaud  
 Chief Medical Officer/  
 Chairman, Institutional Review Board