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RESEARCH ARTICLE

THE KNOWLEDGE ATTITUDE AND PRACTICE OF DIABETIC PATIENTS AT A TERTIARY HOSPITAL IN AN EASTERN CARIBBEAN NATION-A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Diabetes Mellitus (DM) is a chronic, lifestyle disease, and an emerging epidemic of the 21st century. Assessing the Knowledge, Attitude, and Practice (KAP) related to diabetic patients among the public is important to modify or create strategies for prevention &management in an effort to curb the current rise in DM and its complications. As of today, two KAP studies were conducted related to diabetic patients in Trinidad & Tobago (T&T) but both of these studies were conducted on diabetic patients attending local health centres and neither of these studies assessed the patient's knowledge on HbA1c testing as well as their level of education. **Purpose of this study:** The purpose was to conducta KAP study for the first time on hospitalized diabetic patients in Trinidad & Tobago and also to assess their knowledge of HbA1c testing as well as their level of education in addition to other parameters. **Method:** This is a cross-sectional study (KAP) conducted at San-Fernando General Hospital, Trinidad and Tobago between 01st January 2018-31st December 2018 on 1005consecutive diabetic patients who were admitted on both medical and surgical wards. Diabetic patients who denied taking part in this study were excluded. Patients were assessed by a pre-structured, interviewer-administered questionnaire. **Result:** 1005 diabetic patients were included in the study.55.52% of our study group were male and 78.2% were of East Indian. The mean age of our patients was 45 years and 2/3rd of them(63.38%) fell between the age groups 34-65 years. Only 9.85% of our patient had a higher level of education however, rest had an education up to secondary level.90% of our study population were generally aware of diabetes, its complications and preventative measures; however, 72.5% of them had knowledge on foot care.It was found that approximately 80% of our diabetic patients were counselled by a dietician and were aware of the proper diabetic diet,yet49.3% still used sugar in their diet. Despite the availability of free HBA1C testing in the tertiary hospital, it is still unknown to the majority of this cohort. **Conclusion:** The overall level of knowledge of diabetes, its complications, prevention, and management in our study population was good and well above average however, their practice still remained grossly below average. Bridging this gap involves interventions a bit more complex and requires lifestyle and attitude modifications. Point of care HBA1c testing, as well as integrated health education to our health care providers and to our patients, might help to bridge the gaps. Integrated health education involving the patients as well as the family members who taking care of them can perhaps bring a change in their attitude towards their health and physical wellbeing.

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INTRODUCTION

Diabetes mellitus is one of the leading causes of morbidity and mortality in the Caribbean and in Trinidad & Tobago it is the second most common cause of mortality (Boyne, 2009; Gulliford, 1998; Midyear population statistics 2000, 2000). According to the WHO profile of 2016; the prevalence rate of diabetes in Trinidad & Tobago is 12.5% (male 10.9%, female 14.1%). DM accounts 14% of the total deaths of the country. The total number of deaths attributable to high blood sugar was 2210; ages 30-69 -1000 (male 490 female 340) and ages over 70 -1210 (male 580 female 630) (World Health Organization-Diabetes country profiles).

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The WHO profile observed a higher percentage of our diabetic population initially present with a complication. This not only negatively impacts on individual patient health but also negatively influences the social and economic wellbeing of the country. In this study, we would like to know whether the knowledge, attitude and practice of our hospitalized diabetic patients are different than previously conducted KAP study in T&T or not. Also to document the educational levels of our diabetic patients and their knowledge on HBA1c testing and its significance

METHODOLOGY

This study was conducted at the San Fernando Teaching hospital in Trinidad and Tobago, serving approximately 400,000-500,000 populations. It is a cross-sectional study conducted from January 01st–31st, December 2018 on 1005consecutive diabetic patients who were admitted in medical and surgical wards. The patients were identified from the hospital admission registers and data was collected prospectively for the study purpose. Ethical approval was obtained from the institutional review board to conduct this study during this period.

Inclusion Criteria: Diabetic patients on both medical and surgical wards

Ages greater than or equal to 18 years
Cognitive patient

Exclusion Criteria: Gestational DM

Ages less than 18

Questionnaire Design: A structured questionnaire was developed to investigate key research questions comprised of both open and close-ended questions. Each participant was interviewed and the data was interpreted by a medical practitioner. The questionnaire was divided into 6 main categories, including demographics, socioeconomic status, diabetes history, and knowledge, attitude, and practice-related information. Knowledge was assessed using 5 questions related to diabetes comprising of; general knowledge of the disease, complications, knowledge of Hba1c testing, diabetes prevention, diabetic foot care, and diet.

The practice was assessed through glucose monitoring, follow-up care, diet, and exercise, use of sugar and use of appropriate footwear.

Definitions

Knowledge defined as the understanding of information regarding diabetes

Attitude defined as the approach of the population towards diabetes

Practice defined as the pattern and regularity towards diabetes

Statistical Analysis: Data were entered and analyzed using Microsoft Excel version 2010. Percentages and proportions were used to describe categorical variables.

RESULTS

There were 1005 diabetics patients in our study; 54% from the surgical admission, and 46% from the medical admission.55.52% (558) of our study group were male and44.47% (447) were female63.38% of our study group fell between the ages 35-64 years. The ethnic distribution of our study population was 69.75% East Indian, 21.79% African and 8.45% were of mixed ethnicity. This higher percentage of our patients can be well explained by the fact that East Indian's predominately reside around our hospital. It was noted that approximately 45% of our patients had primary and 45% secondary and only 10% had a tertiary level of education. However; it is very hard to speculate from this study that diabetes is less prevalent amongst people with higher education. As these patients because of their economic solvency might go their specialist at a private institute rather than coming to a Government hospital.

Table1. Showing Demographics of patients in our study

Demographics	Variable	Number
Gender	Male	558(55.52%)
	Female	447(44.47%)
Age	18-34	23 (2.28%)
	35-64	637 (63.38%)
	65 and above	345 (34.32%)
Ethnicity	African	219 (21.79%)
	East Indian	701 (69.75%)
	Mixed	85 (8.45%)
Level of Education	Primary	460(45.77%)
	Secondary	446 (44.37%)
	Tertiary	99 (9.85%)

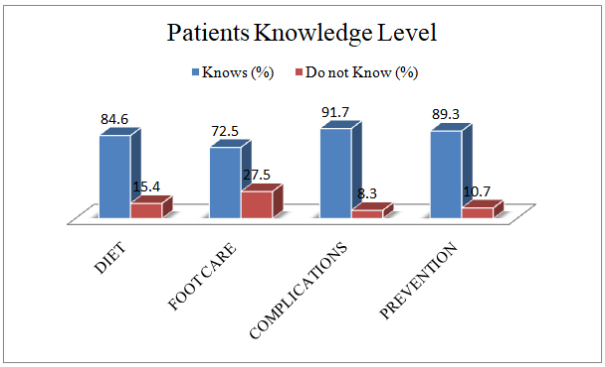

Figure 2. Level of knowledge amongst our study population-

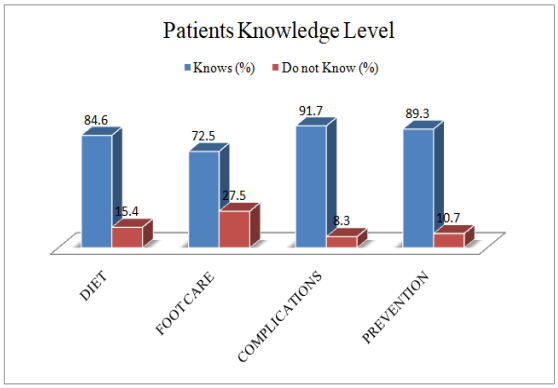

Figure 3. Patients knowledge on (a) blood Sugar level and (b) HBA1C test

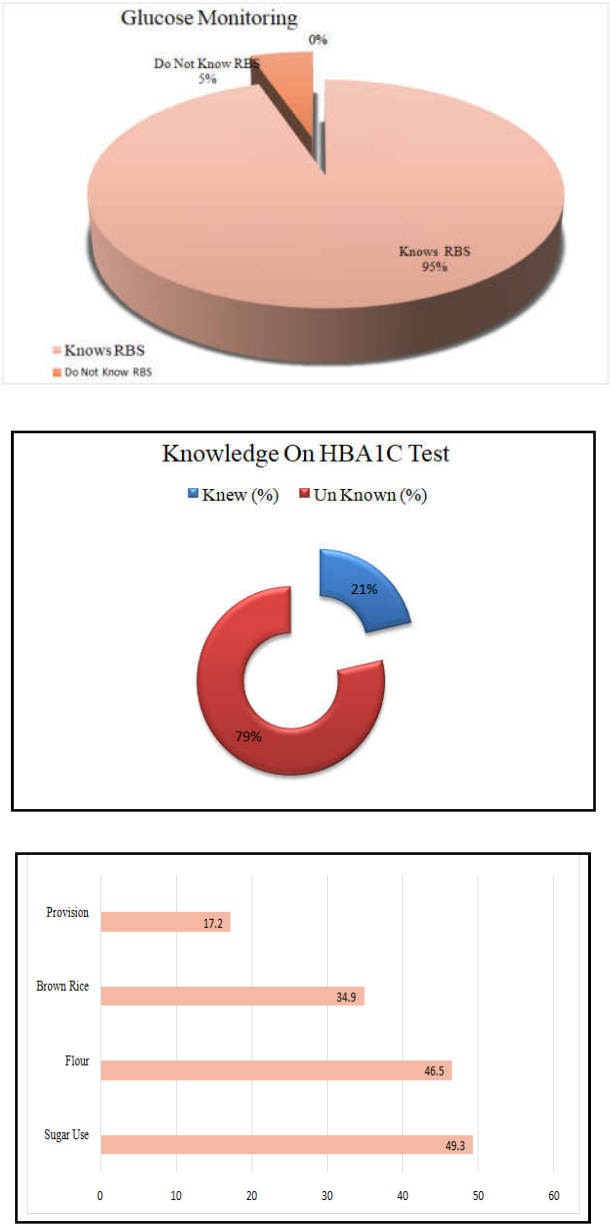

Figure 4. Dietary pattern in our sample population-

A large number of our study population (88%) owned a machine to monitor their blood sugar; this is because of the government free donation to all these patients. 95% of our patients were aware of their RBS reading. Despite a relatively low education level (90% up to secondary education); most of our patients were generally aware of diabetes, its complications, preventions and foot care however, HBa1c testing still remained unknown to the majority. It was found that approximately 80% of our patients were counselled by both dietician and by the diabetic nurse counsellor. Despite that 49.3% of our patients still regularly used sugarin their diet despite having being counselled. The principal daily staple foods amongst the study population were flour, brown rice and ground provision approximating 46.5%, 34.9% and 17.2% respectively. Due to westernization and or economic affluence, many patients frequently buy meals from restaurants and soft drinks become a part of their regular meals. They often forget that they should not consume these types of foods as they have a false impression that simply taking their diabetic medications will control their blood sugar.

This finding reflects the overall careless and poor attitude of our patient's towards their disease despite adequate knowledge.

DISCUSSION

Trinidad and Tobago (T&T) is a twin-island in the Eastern Caribbean region with a total area of 5153 km^2 (1982 square miles) and a population of just over 1.3 million. The ethnic composition of the population is as follows- Afro-Trinidadian (37.5%), Indo-Trinidadian (40%), mixed-race (18.5%), and Chinese (0.5%)[3].The San Fernando Teaching Hospital is located in the southern part of Trinidad and serves 400,000–500,000 populations. Diabetes is a preventable lifestyle disease that overwhelms our already exhausted health care system financially. More than 200,000 people are now living with diabetes, in Trinidad and Tobago, however 25% of them are not aware of it. One-third of the children in both primary and secondary schools are either overweight or having juvenile diabetics said by the first vice president of the Diabetes Association of Trinidad and Tobago[5]. Despite having a fully implemented action plan and referral system from primary care to tertiary level in T&T, unfortunately, a higher percentage of our diabetic patients present initially with a complication. The exact reason for this late presentation in our population is not yet fully known.

The John Hopkins study in T&T (TTHSI) noted that high-calorie intake and sedentary lifestyles due to the increasing affluence of the population results in a high prevalence of diabetes in T&T[6]. Similar findings were also noted in the recent WHO profile of diabetes in T&T. They noted that overweight, obesity, and physical inactivity are important risk factors for the high prevalence of diabetes accounting 63.1%, 32.2%, and 41.7% respectively, and are more prevalent among females than males (World Health Organization-Diabetes country profiles). Boda et al; noted four main challenges in managing and reducing the incidence of diabetes in Trinidad & Tobago i.e1) The high prevalence rate, 2) mixed socioeconomic factors, 3) delivery of the treatment and 4) substantial economic impacts (Boda, 2013). Health care services are completely free to all residents and citizens and no user fees are generated to access this health care delivery. All basic technologies and diabetic medications are free and readily accessible to all of its residents and citizensin any of the pharmacies across Trinidad & Tobago. However, a recent survey amongst the health professionals (doctors and nurses) noted the barrier to access optimal diabetes care are as follows- inadequate time to screen and evaluate DM complications, limited access to consultants for referral of difficult cases, blood testing, ophthalmological evaluations, and cardiac stress tests and lack of provider education regarding cardiovascular complications of DM (Roopnarinesingh, 2015).

Two previous KAP studies conducted at the primary care setting in Trinidad and Tobago showed mixed results. The Penal Self-Care study found that one in three of their diabetic patients had failed to take their prescribed medication or stopped taking them whenever they "felt better and nearly all of them failed to perform regular physical exercise (Webb, 2016). On the other hand, Nicole et al in another KAP study noted positive attitudes but medium levels of knowledge, and practice among their diabetic patients (Nicole, 2012).

However, 92.6% of our study population had good knowledge of diabetes and its complications irrespective of their educational level, ethnicity, or social status. Webb et al noted that patients who had nutritional counselling were more knowledgeable about diabetes than those who did not and had a more positive attitude towards their health[9].The high level of knowledge in our study population may be due to mandatory diabetic nurse and dietician counselling to all hospitalized patients. Several KAP studies on diabetes have shown that lower age, higher level of education, and higher socioeconomic status were positively associated with good diabetes knowledge, and practice (Perera, 2013; Feleke, 2013). The findings of our study contradict the statement, as 90% of our study groups had only primary and secondary education. However, irrespective of their age, educational level, and socioeconomic status almost all of them had good knowledge on the diseases, its complications, and preventative steps. Unfortunately, this high level of knowledge amongst our study groups did not transfer into their practice. Similar findings were also noted in a recent study from Sri Lanka in 2017 (Perera, 2013). Another study conducted among diabetic patients in Qatar found that patients attitude was correlated with the level of educational attainment (Kheir, 2011).

A positive attitude toward seeking healthcare for DM was strongly associated with having sufficient income for most of the time compared with an insufficient income for the whole year ($p = 0.011$), with similar results reported in the study in Bangladesh (Amirul Islam, 2014). The key finding of our study is the obvious gap between the knowledge and practice which we think; it had to do with the attitude of our population towards their health. This finding also correlates with other KAP studies done worldwide. The exact reason for this attitude of our population is not yet clear. The John Hopkins study suggested that interventions are necessary to address the behavioural and self-care needs of the patients, including peer-counsellor programs for diabetes self-care, education, and training (Hopkins, 2012). In general, the Caribbean population is very fun loving, easy-going, takes things lightly, and tends to enjoy their life fully. These unique characteristics as well as economic affluence leads them to forget their sickness momentarily and engage in unhealthy eating and drinking practices, thinking that their medication will help to control their blood sugar. This inherent thinking is deep-rooted amongst in population.

Tight glycaemic control is of paramount importance not only for the reduction but also for the prevention of diabetic-related complications. Regular HbA1c testing is now recommended for all diabetic patients due to its impact on overall health outcomes (American Diabetes Association, 2016). HbA1c testing has been considered for decades as one of the most important advances in the care of diabetes. It gives an overall idea how the patient's blood sugar was maintained over the past 3 months. It is indeed a vital step for the effective management of diabetes. HbA1c testing can be done either as traditional laboratory testing or at the Point Of Care (POC) service. However, one of the main disadvantages of the traditional HbA1c testing is that results are not readily available at the time of the patient's visit which leads to further delay in treatment modifications or intensification. This, in fact, can reduce patient adherence to the treatment plan (Cagliero, 1999). Similarly, pre-visit HbA1c testing can be costly and inconvenient for the patients as it requires a second visit. Moreover, patients often forget to do the testing before the doctor's visit (Weykamp, 2013; Lian, 2014). On the contrary, POC testing is a highly advantageous technique for the management of diabetes as it is done at or near the site of patient care. It is very convenient for the patients, it saves cost and time for a second visit and there is no risk for forgetting to do the test. Therefore, treatment modification or intensification can be done instantly[19]. POC HbA1c testing is now recommended by the American Diabetic Association (ADA) for the management of diabetic patients (American Diabetes Association, 2016). The benefits of POC HbA1c testing are well documented in a recent systematic review by Oliver Schnell et al. (2017). They noted that POC HbA1c testing increases patient's compliance with testing frequency and treatment adoption; thereby improving clinical outcomes and quality of life. It also saves time and cost not only for the patients but also for the health-care providers. In the future, it can be used as a useful tool for early detection of pre-diabetes and diabetes, which can reduce or prevent diabetes-related complications. A recent study in Trinidad found that regular monitoring of glycaemic level as well as health education on diabetes, diet, and exercise at a primary health care facility improved glycaemic control after 3 years (Babwah, 2011). This finding underscores the importance of HBA1c testing at the point of care clinic. In Trinidad and Tobago, traditional HbA1c testing is available at all of our tertiary hospitals. However, the exact knowledge level of HBA1c testing for glycaemic control amongst our patients was not known. Most of our patients were aware of their blood sugar level but not aware of the HBA1c testing and its significance on their diabetic management. This lack of knowledge on HBA1c testing amongst our study population may be due to lack of health education regarding HbA1c testing and its impact on their health which could be a failure on the part of our health care providers.

Information on HbA1c testing should be a part on the discussion while counselling by the health care providers, i.e, diabetic nurse counsellors, and doctors. Similarly, POC HbA1c testing needs to be introduced in all of our primary and secondary health care facility which can boost their knowledge on the importance of HbA1c testing and its impact on their individual health. A study has shown that delays in treatment modification or intensification are usually associated with a longer period of hyperglycaemia and diminishes the chance of success (LeBlanc, 2015). Recently the Ministry of Health and Education of T & T has embarked on a positive initiative to reduce the consumption of added sugar beverages within the nation's schools. It is indeed an important step but we need to educate our future generations why not to do certain things, and how to do it properly before being taken away something from someone or tell them not to do. Further studies need to be conducted to find out the exact reason why our people, despite their high awareness of diabetes, do not find themselves at risk for diabetic complications or there is a lack of financial, familial, or social support to promote or sustain healthy practices. It is also critical to explore for any other factors that can better explain the attitude of our population towards the disease.

Conclusion

DM and its complications present a large burden on our health care system. Hospitalized patients had a better understanding of diabetes and its complications than patients

from local health centers noted in the two past KAP study conducted in T&T. However, the practice still remained grossly below average. This finding can be attributed to one's attitude towards their health which may be difficult to change and requires a bit more complex modification strategies to be implemented. Our study found out that most of our patients were not aware of HBA1c testing and its implication on their glycaemic control. We, therefore, propose HBA1c testing; at the point of care service along with integrated health education to the health care providers as well to the diabetic patients as one of the key methods to bridge the gaps between the knowledge and practice level in our population. Drastic action needs to be taken to curb the current trend in rise of diabetes patients as well to take appropriate steps to change the attitude of our diabetic population towards their health. There are rooms for improvement in public health strategies to prevent diabetic foot complications and diabetic retinopathy. The introduction of a mobile arm of the diabetic foot care and a fundoscopy team may be an initial method to improve prevention and early detection. Clinicians should focus on patient education while the patient is still in the hospital or enrolled in other specialty clinics. The focus should also be placed on lifestyle modification and compliance with medical therapy.

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