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ORIGINAL ARTICLE

Knowledge and Practice of Preventive Measures against Diabetes Mellitus amongst Secondary School Teachers in Awka South LGA of Anambra State, Nigeria

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ABSTRACT

INTRODUCTION: Diabetes mellitus (DM) is a growing public health concern in both developed and developing countries. The successful management of the disease is however dependent on the patients' abilities to undertake self-care in their daily lives. Patient education is also considered an essential component of achieving this objective.

AIM/OBJECTIVES: To determine the knowledge, attitude, practice and factors influencing the practice of preventive measures for diabetes mellitus amongst secondary school teachers in Awka South LGA of Anambra state.

METHOD: This is a descriptive cross-sectional study in which data was collected using self-administered questionnaires among 180 consenting study participants. The Cluster sampling technique was used to select the study participants. Response rate was 99%.

RESULTS: The mean knowledge and attitude scores were 31.76 ± 12.0% and 58.28 ± 26.02% respectively. The respondents that do not perform exercise were 36 (22.5% while 34 (21.3%) exercise daily and 30 (18.8%), exercise once in a week. Less than half of the respondents 72 (43.6%), practice regular/ routine medical checkup. It was observed that 41.3% attributed the major factor which positively influenced the practice of DM to always been health conscious as a person and 27.4% to been aware of DM and the problem it causes while 32.7% attributed the major factor which negatively influenced their practice of preventive measures to not being well informed of DM while 30.9% don't believe they can suffer from the disease and 27.3% do not have time. There is a statistical significant difference between Gender, Marital status and Ethnic group and the practice of regular/ routine medical checkup among the respondents (χ^2=7.236, p = 0.007), (χ^2=0.048, p = 0.048) and (χ^2=0.003, p = 0.003) respectively. A high proportion of the respondents 137 (80.6%) do not consume alcohol in comparison with those who do, 33 (119.4%). All of the respondents 168 (100%), do not smoke.

CONCLUSION AND RECOMMENDATIONS: This study demonstrated a poor mean knowledge and fair attitude scores towards DM. Most of the preventive measures were practiced by a high proportion of the respondents except for routine medical checkup which was practiced by less than half of the respondents. Proper education and awareness program tailored to the need of the patients' group can improve their knowledge, change their attitude and improve their practice of preventive measures towards DM.

INTRODUCTION

Diabetes mellitus is a clinical syndrome characterized by hyperglycemia caused by relative or absolute insulin deficiency[1]. The prevalence of DM is rising in African communities, and many factors are responsible for this increase, including unhealthy western lifestyles with reduced physical activity, sedentary lifestyles, and excessive intake of calories. These contribute to obesity which is a risk factor for the development of diabetes[2,3]. Perhaps due to lack of proper awareness and education, diabetes sufferers are particularly prone to complications and increased mortality. Urbanization with adoption of "western lifestyles" has been incriminated in the abandonment of the healthier "traditional lifestyles" by people in developing countries. The traditional lifestyle was characterized by regular and vigorous physical activity accompanied by subsistence on high fiber, whole grain-based diet rich in vegetables and fruits[4,5].

In Nigeria the prevalence of DM is 2.6 million[6]. It is now emerging as an epidemic of the 21st Century and threatens to overwhelm the health care system in the near future[7]. The manifestations of DM can cause considerable human suffering and enormous economic costs. Both acute and late complications are commonly encountered. The long term complications represented by cardiovascular, cerebrovascular disease, nephropathy, retinopathy and neuropathies are already major sources of morbidity and mortality, disability and premature deaths in countries of the east Mediterranean region[8]. Despite that the cause of DM is unknown; many of its modifiable lifestyle-related risk factors have been identified and studied. The accumulating evidence suggests that DM is a potentially preventable disease if its risk factors are identified early and avoided[9-11]. Lifestyle interventions (e.g. physical activity, weight loss) have proven to be more effective than medicine in preventing or delaying the onset of diabetes mellitus in persons at high risk of developing the disease[9].

However, transferring such evidence into an effective community intervention program requires an understanding of the specific needs of the communities before introducing any kind of intervention[12,13]. In addition, policy makers and public health practitioners need reliable and valid data regarding the distribution and determinants of DM related health issues among the populace. To curb the scourge of DM, public health interventions are required to prevent or delay the onset of its complications.

Knowledge is usually transferred to the children from their teachers either directly through teaching or indirectly via teacher's attitude and practices. These children see their teachers as role models, imitating their behavior and acquiring their knowledge[14]. Teachers are considered to be the first line of protection for school children. Apart from parents, school teachers are the main care-givers to these children[15]. Care is provided to this sector of the population (school children) mainly by two sources: home and school. Commonwealth governments recognized that schools are excellent places for promotion of better health as part of the proposed National Health Strategy[16]. Learning about DM risk factors and preventive measures is the first step in prevention since it will enable the public to make the informed decision of adopting a healthy lifestyle[9,11]. Teachers are in a better position to impart good knowledge and positive attitude on their students about this disease and engender the adoption of healthy DM preventive practices.

Thus the objectives of the study are to determine (1) The knowledge and attitude towards DM; (2) The practice of preventive measures for the development of DM; (3) The factors associated with the practice of these preventive measures for DM among secondary school teachers in Awka South L.G.A.

METHODOLOGY

Study area: Awka, is the capital of Anambra State, Nigeria and is strategically, located midway between two major cities in Northern Igboland, Onitsha and Enugu. Awka is home to many schools; primary, secondary and tertiary institutions. The economy of Awka city revolves primarily around government since many state and federal institutions are located there.

Study population: Secondary school teachers in Awka South LGA, Anambra state.

Study design: Descriptive cross-sectional study among secondary school teachers in the area.

Sample size calculaton

The sample size for the study was calculated using the formula:

$$n = \frac{z^2 pq}{d^2} \, [17]$$

Where

n = minimum sample size

z = Standard normal deviate, usually set at 1.96 at 95% confidence level

p = prevalence of respondents who had poor attitude towards DM in a Sri- Lankan study is 88% [18]

q = 1 - P

d = degree of precision, usually set at 0.05 (margin of error at 5%).

$$n = \frac{1.96^2 \times 0.88 \times (1\text{-}0.88)}{0.05 \times 0.05}$$

$$n = \frac{3.84 \times 0.88 \times 0.12}{0.0025}$$

n = 162

Minimum sample size of a finite population (< 10,000) was determined using the formula

$$nf = \frac{n}{1 + (n/N)} \, [17]$$

Where N = Estimate of the population size which is 491

nf = Desired sample size when population is < 10,000.

n = Desired sample size when population is > 10,000.

$$nf = \frac{162}{1 + 162/491}$$

$$= 122$$

Assuming a 90% response rate, Attrition rate therefore will be: 0.9

$$\frac{122}{0.9} = 135.5$$

$$= 136 \text{ questionnaires.}$$

Sampling method

The cluster sampling technique was used for this study. There are a total of eighteen (18) public secondary schools in Awka South LGA. Each of these schools represents a cluster. Four (4) of these schools were selected using the simple random sampling technique. Every available teacher employed within each of these schools who agreed to take part in the study and gave an informed consent, was enrolled into the study.

Method of data collection

This instrument for data collection was a self-administered, semi-structured questionnaire which was used to obtain socio-demographic data like age, sex, marital status, religion, ethnic group, highest educational status attained and subjects taught. A section of the

questionnaire contained questions that tested the knowledge, attitude and practice of preventive measures as well as the factors influencing the practice of preventive measures.

Knowledge of Diabetes Mellitus was assessed based on knowledge of DM score; respondents were assessed on their knowledge of the meaning, symptoms, complications and preventive/control measures. Attitude towards DM was also scored as respondents were assessed on their thoughts towards the following: the reality of the disease, the effectiveness of some preventive and control measures, ability to live a normal life if blood sugar is controlled and the need for eating restrictions if blood sugar is controlled. The total scores obtained on knowledge and attitude for each respondent were converted to percentages, and the mean knowledge and attitude scores were computed.

On the practice of preventive measures, respondents were assessed on the frequency of exercise, attendance to regular medical checkup, alcohol consumption and cigarette smoking. Responses to the individual questions were assessed in order to evaluate the positive and negative practices.

Data analysis

Statistical Package for Social Sciences (SPSS) version 20 was used in statistical analysis. Frequency distribution of all relevant variables was done. Relevant means and standard deviations were calculated. Test of significance using Chi-square were conducted and the accepted level of significance is 5%.

Ethical consideration

Informed consent was obtained from all respondents. No names were recorded on the questionnaires to ensure confidentiality. Ethical approval was obtained from Nnamdi Azikiwe University Teaching Hospital Ethics Committee through the Head of Department of Community Medicine.

RESULTS

A total of 182 questionnaires were distributed among the 4 secondary schools selected for the study. A total of 180 questionnaires were retrieved, giving a response rate of 99%.

Table 1 shows the socio- demographic characteristics of the respondents. The mean age of the respondents was 35.91 ± 1.6 years. More of the respondents were females 81.9% in comparison with the males 18.1%. All of them were Christians 100%, with a high proportion having a Bachelor's degree, 78.1%.

Table 2 depicts the respondents' knowledge and attitude towards Diabetes Mellitus. The mean knowledge and attitude scores were $31.76 \pm 12.0\%$ and $58.28 \pm 26.02\%$ respectively.

Figure 1 illustrates the sources of information on Diabetes Mellitus. The major sources of information on Diabetes Mellitus were Health/ Hospital personnel 67 (34.5%), TV/ Radio 42 (21.6%) and Family member 33 (17.0%).

Table 3 shows the factors that positively influenced the practice of preventive measures against DM. The major factors which influenced the practice of DM were, always been health conscious as a person 41.3% and aware of DM and the problem it causes, 27.4%.

Table 4 depicts the factors that negatively influenced the practice of preventive measures against DM. The major factors that negatively influenced the practice of preventive measures were I am not well informed of DM 32.7%, I do not believe I can suffer from DM 30.9% and I do not have enough time, 27.3%.

Table 5 shows the performance of exercise among the respondents. The respondents who do not exercise were 36 (22.5%). Also 34
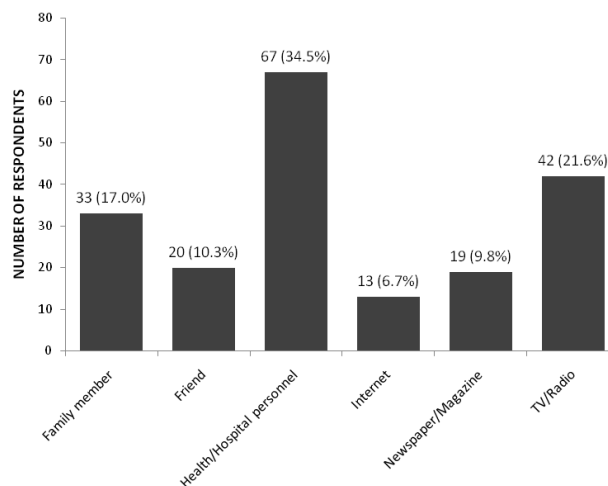

Figure 1 Sources of information on Diabetes Mellitus.

(21.3%) of the respondents exercise daily while 30 (18.8%), exercise once in a week.

Table 6 shows the grading of exercise performance among the respondents. Less than half of the respondents 41.9%, had good practice of exercise while 35.6% and 22.5% had fair and poor practice respectively.

Table 7 shows the influence of knowledge and attitude on the performance of exercise.

There is no statistically significant difference between the knowledge and attitude scores and the performance of exercise (Fischer exact = 2.46, p = 0.09) and (Fischer exact = 0.46, p = 0.64) respectively.

Table 8 depicts the influence of socio-demographic characteristics on the performance of exercise. There is no statistical significant difference between the socio- demographic characteristics of the respondents and the performance of exercise.

Table 9 illustrates the practice of regular/routine medical checkup among the respondents. Less than half of the respondents 72 (43.6%), practice regular/ routine medical checkup.

Table 10 shows the frequency of practice of regular/ routine medical checkup among the respondents. Among those who attend medical checkup, 30 (43.5%) attend medical checkup every 3 months, 21 (30.4%) attend every 6 months while 18 (26.1%) attend yearly.

Table 11 shows the influence of knowledge and attitude on the practice of regular/ routine medical checkup among the respondents. There is no statistically significant difference between the knowledge and attitude scores and the practice of regular/ routine medical checkup among the respondents. (Fischer exact = 1.20, p = 0.30) and (Fischer exact = 2.07, p = 0.13) respectively.

Table 12 illustrates the influence of socio-demographic characteristics on the practice of regular/ routine medical checkup among the respondents. There is a statistical significant difference between Gender, Marital status and Ethnic group and the practice of regular/ routine medical checkup among the respondents (χ^2= 7.236, p = 0.007), (χ^2= 0.048, p = 0.048) and (χ^2= 0.003, p = 0.003) respectively.

Table 13 shows alcohol consumption among the respondents. A high proportion of the respondents 137 (80.6%) do not consume alcohol in comparison with those who do, 33 (119.4%).

Table 14 shows the number of 60cL bottle consumed by respondents in a week. Among those who consume alcohol, 2 (6.5%) respondents consume 5 or more bottles in a week.

Table 15 shows cigarette consumption among respondents. All of the respondents 168 (100%), do not smoke.

Respondents who do not exercise at all are termed to have poor practice, those who exercise once or twice in a week, are termed to have moderate practice, while those who exercise more than three times in a week are termed to have good practice.

DISCUSSION

The mean age of the respondents was 35.91 ± 1.6 years. This is similar to the mean age of teachers reported in prior studies[19,20]. Knowledge is usually transferred to the children from their teachers either directly through teaching or, which is the most important, indirectly via teacher's attitude and practices. These children see their teachers as role models that they copy imitating their behavior and acquiring their knowledge. The mean knowledge score of the respondents was 31.76 ± 12.02% and 34.5% of the respondents got their information about the disease from the hospital and health personnel, while the rest sourced theirs from mass media, family members and friends. The mean knowledge score recorded for this study is low and this is similar to the findings of several studies in which teachers had low knowledge about the disease[21,22]. However, a study done by Faisal AL among secondary school teachers in Bahrain reported a higher mean score of 53.4%[23]. Knowledge is the greatest weapon in the fight against DM[24]. Knowledge of diabetes can prevent the imminent chronic comorbidities of DM, which impact significantly on the quality of life of the diabetic patients[25]. Information can help people to assess their risk of diabetes, motivate them to seek proper treatment and care, and inspire them to take charge of their disease for their lifetime[24,25]. A literature search on knowledge about diabetes in developing countries yielded very few studies dealing with awareness of diabetes among people with the disease and there are virtually no data on whole populations[25]. Teachers generally have a poor level of knowledge about diabetes and its management[26]. This calls for an urgent need to increase the awareness about DM and other prevailing health conditions, as once awareness is created, people are more likely to participate in prevention and control activities.

This study demonstrated a mean attitude score of 58.28 ± 26.02%. This is in constrast to the findings of several studies in which more of the respondents had a negative attitude towards the disease[18,24,27]. However, a study conducted in Bangladesh among diabetic and non-diabetic subjects demonstrated a mean attitude score of 85 ± 12%[25]. With regards to practice of preventive measures against DM, it was observed that 22.5% of the respondents do not exercise at all, 35.6% exercise once or twice in a week while 41.9% exercise more than 3 times in a week. This shows that 77.5% of the respondents performed exercise at different frequencies in a week. This is comparable to the findings of a review article among teachers in which 75% did physical activities at different frequencies per week. This disagrees with the findings of a study conducted in Kenya where 72% did not participate in regular exercise[24]. In a study conducted among urban residents in Cameroon, although participants acknowledged the health benefits of physical activity, most admitted they did not engage in any, regularly or irregularly[28].

Respondents were assessed on their practice or attendance to regular medical checkup. Assessments done during routine medical checkup in relation to the practice of preventive measures for this study were Fasting blood sugar measurement, Blood pressure measurement and weight measurement. It was observed that less than half of the respondents 43.6% attended regular medical checkup.

Table 1 Socio-demographic characteristics of the respondents.

		N	(%)
Age	25 years and below	35	23.8
	26-35 years	42	28.6
	36-45 years	25	17
	46 years and above	45	30.6
Mean age 35.91 ± 1.6 years			
Gender	Male	32	18.1
	Female	145	81.9
Marital status	Single	68	38.2
	Married	106	59.6
	Widow	3	1.7
	Separated	1	0.6
Religion	Christian	179	100
Ethnic Group	Igbo	149	83.2
	Others	30	16.8
Educational Status	NCE	9	5.1
	HND	15	8.4
	B.Sc/BA/B.Ed	139	78.1
	Masters	12	6.7
	PhD	3	1.7
Subjects Taught	Sciences	63	40.6
	Arts	92	59.4

Table 2 Respondents knowledge and attitude towards Diabetes Mellitus.

	N	Min	Max	Mean	SD
Knowledge score (%)	179	0	81	31.76	12.02
Attitude score (%)	180	0	100	58.28	26.02

Table 3 Factors that positively influenced the practice of preventive measures against DM.

	N	(%)
Family history of DM	25	14
Aware of DM and the problem it causes	49	27.4
My doctor's advice	28	15.6
Always been health conscious as a person	74	41.3
I have already been diagnosed of DM	3	1.7

Table 4 Factors that negatively influenced the practice of preventive measures against DM.

	N	(%)
I do not have enough time	30	27.3
I am not well informed of DM	36	32.7
I am already using herbal concoctions	7	6.4
I do not believe I can suffer from DM	34	30.9
I do not believe DM actually exists	3	2.7

Table 5 Performance of exercise among the respondents.

Weekly	N	(%)
None	36	22.5
Once	30	18.8
Twice	27	16.9
Thrice	19	11.9
Four	4	2.5
Five	9	5.6
Six	1	0.6
Seven	34	21.3

Table 6 Grading of exercise performance among the respondents.

	N	(%)
Poor	36	22.5
Fair	57	35.6
Good	67	41.9

Table 8 Influence of socio-demographic characteristics on the performance of exercise.

	χ^2	df	p
Age	5.095	6	0.532
Gender	0.817	2	0.665
Marital status	12.429	6	0.053
Ethnic group	2.151	2	0.341
Educational qualification	14.558	8	0.068
Subjects taught	2.343	2	0.31

Table 10 Frequency of practice of regular/routine medical checkup among the respondents.

	N	%
Yearly	18	26.1
Every 6 months	21	30.4
Every 3months	30	43.5

Table 12 Influence of socio-demographic characteristics on the practice of regular/routine medical checkup among the respondents.

			χ^2	df	p
Age	25 and less	10 (34.5%)	5.978	3	0.113
	26-35 years	15 (40.5%)			
	36-45 years	9 (39.1%)			
	46 and above	27 (60.0%)			
Gender	Male	7 (22.6%)	7.236	1	0.007*
	Female	65 (49.2%)			
Marital status	Single	20 (31.7%)	7.885	3	0.048*
	Married	49 (50.5%)			
	Widow	2 (66.7%)			
	Separated	1 (100.0%)			
Ethnic group	Igbo	67 (48.9%)	9.112	1	0.003*
	Others	5 (17.9%)			
Educational status	NCE	4 (57.1%)	4.843	4	0.304
	HND	6 (42.9%)			
	B.Sc/BA/B.Ed	53 (41.4%)			
	Masters	6 (50.0%)			
	PhD	3 (100.0%)			
Subjects taught	Sciences	23 (39.0%)	1.333	1	0.248
	Arts	40 (48.8%)			

*Statistically significant.

Table 7 Influence of knowledge and attitude on the performance of exercise.

	Poor	Fair	Good	df	F	p
	M (SD)	M (SD)	M (SD)			
Diabetes Knowledge score	29.22 (10.47)	34.52 (13.23)	31.73 (10.08)	2,156	2.46	0.09
Diabetes Attitude score	55.00 (28.34)	59.65 (24.78)	59.85 (26.54)	2,157	0.46	0.64

F: Fischer exact.

Table 9 Practice of regular/routine medical checkup among the respondents.

	N	%
Yes	72	43.6
No	93	56.4

Table 11 Influence of knowledge and attitude on the practice of regular/routine medical checkup among the respondents.

	Yearly	6 monthly	3 monthly	df	F	p
	M (SD)	M (SD)	M (SD)			
Diabetes knowledge score	35.19 (16.49)	35.45 (15.91)	30.00 (11.15)	2, 66	1.2	0.3
Diabetes attitude score	66.11 (25.70)	58.57 (29.20)	51.33 (19.95)	2, 66	2.07	0.13

F: Fischer exact.

Table 13 Alcohol consumption among the respondents.

	N	%
Yes	33	19.4
No	137	80.6

Table 14 Number of 60cL bottle consumed by respondents in a week.

	N	%
Half or less	15	48.4
1	10	32.3
2	3	9.7
3	1	3.2
5 and above	2	6.5

Table 15 Cigarette consumption among respondents.

	N	%
No	168	100

A study conducted by Eke *et al* in south east Nigeria demonstrated that 31.5% of the respondents practiced periodic medical check-up (this was mainly for physical examination and blood pressure measurements)[29]. A study conducted by Ilesanmi *et al* in south west Nigeria showed that a higher proportion, 49.3% of all the respondents have ever had a routine medical check- up. Although in this study by Ilesanmi *et al*, an important contributor to the number of respondents that had medical check -up was the serial free screening services that were conducted for members of the community by non- government organizations in conjunction with the health facilities[30]. In a study carried out by Kiawi *et al* in Cameroon, most informants (93%) had never had a blood sugar test, although based on age and BMI, most appeared to be at risk of the disease[28]. In developing countries where the practice of periodic medical check- up is poor despite the steady increase of the burden of the non- communicable disease, very few studies have been conducted on periodic medical check- ups

especially in Nigeria[30].

It was discovered that the knowledge and attitude scores as well as the socio- demographic factors did not significantly influence the performance of exercise among the respondents. It was also noted that less than half of the respondents 41.3%, attributed the major factor which positively influenced their practice of preventive measures to their always being health conscious as individuals, while 27.4% of the respondents attributed their positive practice to their good awareness of DM and its attendant problems. Despite the fact that a low mean knowledge score of $31.76 \pm 12.0\%$ was recorded for this study (lowest score of 0% and maximum core of 81%), being aware of DM and its attendant problems might have been mentioned as a factor which positively influenced their practice of preventive measures by those respondents who had high knowledge scores about the disease. Also, 15.6% of the respondents in this study attributed the factor influencing their positive practice on their doctor's advice. A study conducted by Yuen on factors associated with preventive care practices among adults with Diabetes showed that patients were

about 2 to 6 times more likely to have a specific preventive care in the past 12 months if they were told to do so by a health professional[31].

It was also observed that the knowledge and attitude scores of the respondents, age, educational status and subjects taught did not significantly influence the practice of routine medical checkup in this study. Prior studies have also demonstrated that educational status did not influence the uptake of medical check- up among the respondents[29,30]. This is contrary to what is expected, that health seeking behavior should be higher among those with higher level of education[30]. However, gender, marital status and ethnic group significantly influenced the practice of routine medical checkup. This study reported that more of the respondents who practiced routine medical check- up were females; this agrees with the fact that females are more likely to utilize health care services[30]. This study observed that 32.7% of the respondents attributed the major factor which negatively influenced their practice of preventive measures to not being well informed of DM while 30.9% don't believe they can suffer from the disease and 27.3% do not have time. This shows the importance of improving the knowledge and attitude of the respondents towards DM, which if improved will definitely improve their practice of preventive measures. Elements of KAP are inter- related and dependent on each other. If the level of one element is higher, the other two factors should be affected positively. A study conducted in Bangladesh showed a significant positive correlation between knowledge, attitude and practice. Better knowledge was associated with better attitude and practice and better attitude was associated with better practice[25].

A high proportion of the respondents 80.6%, do not consume alcohol in comparison to 19.4% who did. Also, 6.5% of those who did, consume more than five 60cl bottles in a week. This study reported that none of the respondents smoked cigarette. This is understandable as more of the respondents in this study are females, married and of the Igbo tribe. In all WHO regions, females are less often current drinkers than males, and when women drink, they drink less than men[32]. According to the World Bank collection of development indicators, compiled from officially recognized sources, a smoking prevalence rate of 1.1% was reported in the year 2015 for female adults in Nigeria[33]. These are good preventive practices which are likely to be more effective if practiced alongside with the other preventive measures against DM.

CONCLUSION AND RECOMMENDATIONS

This study demonstrated a poor mean knowledge and fair attitude scores towards DM. Most of the preventive measures were practiced by a high proportion of the respondents except for routine medical checkup which was practiced by less than half of the respondents. The major factors attributed by the respondents to positively influence their practice of preventive measures were health consciousness and being aware of DM and the problem it causes while the major factors which hindered the practice of preventive measures were not being well informed of DM, don't believe they can suffer from the disease and lack of time. There is a statistical significant difference between Gender, Marital status and Ethnic group and the practice of regular/ routine medical checkup among the respondents.

Diabetes education and availability of affordable screening programs will enable early detection of disease, leading to better control of the disease and the complications arising from it. It is also important for the Government and public health workers with the use of the mass media, to carry out more enlightenment campaign on the causes, effects, and complications of Diabetes Mellitus. Teachers

should be encouraged and motivated to carry out physical exercise by the establishment of fitness clubs within the schools both for teachers and students. This will enable group fitness exercises and will be very beneficial for teachers who find it difficult to make out time to carry out exercise.

Limitations

(1) This survey did not identify those with Diabetes among the respondents. Such people would have higher knowledge due to the patient education often provided at the Clinic. (2) Some of the questionnaires were incompletely filled. This is a common observation of the use of self- administered questionnaires.

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