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Research Article

Knowledge, Attitude and Perception of Physicians on Exercise Practices in the Management of Type 2 Diabetes Mellitus

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Abstract

It is important to assess the knowledge of physicians as a first contact point especially on exercise prescription in Type 2 Diabetes Mellitus (T2DM) and evaluate the attitude and perception towards exercise being an important aspect of management of T2DM.

A self-developed questionnaire which was pilot-tested and used as survey instrument. One hundred and fifty-three copies of questionnaires were distributed among physicians employed at the Obafemi Awolowo University Teaching Hospitals Complex, Ile Ife and all were returned fully completed yielding 100% response rate. Data obtained were analyzed using descriptive and inferential statistics of chi square test and p value was set at < 0.05.

The mean score for knowledge was 15.27 ± 1.06 while the mean score for perception was 8.95 ± 1.07. 98% of the respondents had excellent knowledge while 90.2% of the respondents had excellent perception. 95% percent of the respondents are confident to suggest exercise practices. There was a significant association between knowledge of respondents and each of their cadre (X^2 = 32.912, p = 0.001) and each of their specialty (X^2 = 164.905, p = 0.000). There was a significant association between perception of respondent and each of specialty (X^2 = 182.362, p = 0.000), years of experience (r = 0.296, p = 0.000). There was a significant association between respondent's attitude and each of their specialty (X^2 = 214.531, p = 0.000).

In conclusion, the respondents demonstrated an excellent knowledge, satisfactory attitude and excellent perception on the need for exercise practices in the management of type 2 diabetes mellitus and as such, regulated/ accustomed exercise prevents occurrence of T2DM and improves its management outcome

Keywords: Type 2 Diabetes Mellitus; Physicians; Perception; Exercise; Knowledge

Introduction

Diabetes mellitus (DM) is a group of metabolic disorders characterized with chronic hyperglycemia which is due to absolute or relative insulin deficiency or both. T2DM begins with insulin resistance, a condition of improper insulin sensitivity [1]. Type 2 DM, is traditionally considered a metabolic disorder exclusively of adults but has become commoner not only in young adults but also in adolescents and in children [3]. In Nigeria, the prevalence of T2DM has been high and still increasing, with the country widely reported as having Africa's highest burden of diabetes [7]. In the 2013 international Diabetes Federation (IDF) global study, a prevalence of 5% was estimated for Nigeria accounting for 3.9 million cases among persons aged 20-79 years [10]. Even though, the researchers specifically noted that Nigeria was among countries without up-to-date statistics on T2DM [2].

T2DM is characterized by dysregulation of carbohydrate, lipid and protein metabolism and results from impaired insulin secretion, insulin resistance or combination of both, of the three major

types of diabetes, T2DM is far more common (accounting for more than 90% of all cases) than either type 1 diabetes mellitus or gestational diabetes [5]. T2DM and its complications have become a major global public health concern and have contributed tremendously to the burden of mortality and morbidity worldwide [14]. The prevalence of T2DM has been rapidly rising worldwide over the past three decades, particularly in developing rather than in developed countries [3]. It is estimated that 439 million people would have T2DM by the year 2030 [11]. The incidence of T2DM varies substantially from one geographical region to the other, research has shown that there are few data available on the prevalence of type 2 DM in Africa as a whole [9].

Exercise is a planned, structured physical activity which involves repetitive bodily movement performed to improve or maintain one or more components of physical fitness [4]. Exercise training brought about improvements in glycemic control, insulin sensitivity, body composition, physical functioning and cardiorespiratory fitness, with some studies also supporting beneficial effects on lipid status and blood pressure [6].

Combination of aerobic and resistance training have been found to have a great effect on the management of T2DM. Aerobic exercise consists of continuous, rhythmic movement of large muscle groups such as in jogging, walking [6]. Aerobic exercise program has been found to result in greater increase in insulin sensitivity, greater VO_2 max and greater reduction in glycosylated hemoglobin (HbA1c). Resistance exercise involves movement utilizing free weight, body weight exercises, resistance exercise has been found to be an effective intervention to assist glycemic control [13]. There is ample evidence that exercise is an effective and affordable approach to prevent and manage type 2 diabetes mellitus [6].

Physicians and their teams are usually the first contact of T2DM Patients. Hence, the importance of the knowing the effect of exercises in management of type 2 DM. Studies have shown that physician advice and counselling have led to increase in physical activity participation by patients with T2DM [12]. Hence, its treatment, including exercise as part of management would optimize the health outcome [6].

Materials and Methods

Respondents

Respondents for the study were physicians in Obafemi Awolowo University Teaching Complex Ile-Ife.

Inclusion criteria

The inclusion criteria for this study were;

- Qualified physicians with Bachelor of Medicine and Bachelor of Surgery (MBBS/MBCHB) Doctor of Medicine (MD)
- Physicians who have worked in Obafemi Awolowo University Teaching Hospitals.

Complex for more than 6 months.

Exclusion criteria

- Retired physicians
- House Officers

Study design

This is a cross-sectional study.

Sampling technique

The Respondents for this study will be recruited using purposive sampling.

Sample size calculation

The Taro Yamane (1967) technique was used to get the sample size. For estimating a proportion with a population size(N) of 250 and the precision level (e) at 50%.

$$n = \frac{N}{1+(N*e^2)}$$

$$n = \frac{250}{1+(250*\ 0.052)} = 153$$

Thus, a total of 153 respondents will be recruited for this study.

Site of study

The site of study was Obafemi Awolowo University Teaching Hospital Complex, Ile-Ife, Osun State.

Instrument

A self-developed questionnaire was used to assess the knowledge, attitudes and perception of physicians on exercise practice in the management of T2DM. This tool was pilot tested among eight physicians and all ambiguity was removed and the questionnaire was restructured.

Procedure

Approval of the Health Research and Ethics Committee, Obafemi Awolowo Teaching Hospital Complex was obtained before the commencement of data collection. The purpose and procedure of this study were explained to the respondents and their informed consent to participate was obtained. They were also assured that the information gotten from them would be treated with utmost confidentiality. A self- developed questionnaire was administered to the physicians. The data collection questionnaire includes three sections. Section A: Socio demographic variables (age, gender specialty, highest qualification, years of experience and cadre) Section B: Assessment of knowledge of physicians on exercise practices in the management of type 2 diabetes mellitus. Section C: Assessment of attitude of physicians on exercise practices in the management of type 2 diabetes mellitus. Section D: Assessment of perception of physicians on exercise practices in the management of type 2 diabetes mellitus.

Data analysis

Descriptive statistics of mean, frequency, standard deviation and percentage was used to summarize the obtained data. Chi square was used to test for association of the variables. Data analysis was carried out using statistical package for social science software (SPSS version 16). Alpha level was set at > 0.05.

Results

Sociodemographic parameters of respondents

Presented in table 1 is sociodemographic variables of respondents. Male respondents were 68.0% (104), 49.7% (76) of the respondents were single, 41.8% (64) of the respondents were medical officers and 32.1% (51) of the respondents were registrars in their respective department. Seventy-seven percent (107) of the respondents had Bachelor of Medicine and 11.8% (18) of the respondents had Masters degree as their highest educational level certificate. Respondents who specialized in internal medicine were 54.7% (83) and 10.5% (16) specialize in endocrinology.

Variables	Frequency (N)	Percentage (%)
Sex		
Male	104	68.0
Female	49	32.0
Marital Status		
Married	77	50.3
Single	76	49.7
Cadre		
Consultant	5	3.3
Medical Officer	64	41.8
Registrar	51	32.1
Senior Registrar	34	22.2
Highest educational Level		
MB.CHB	107	70.0
MD	20	13.1
MSc	18	11.8
FWACP	8	5.4
Speciality		
Internal Medicine	83	54.7
Dentistry	17	11.3
Endocrinology	16	10.3
Anesthesia	23	15.3
Renal	14	9.4

Table 1: Sociodemographic parameters of respondents.

Descriptive statistics of respondents

Presented in table 2 is the descriptive statistics of respondent's knowledge and perception with their age and years of experience. Mean age of respondent was 32.86 ± 4.88 years and the mean years of experience was 6.34 ± 3.65 years.

Variables	Minimum	Maximum	Mean± Standard deviation
Age	24.00	46.00	32.86 ± 4.88
Years of experience	1.00	14.00	6.34± 3.65
Knowledge Total	11.00	16.00	15.27 ± 1.06
Knowledge Percentage	68.80	100.00	95.45 ± 6.64
Perception Total	6.00	10.00	8.95 ± 1.07
Perception Percentage	60.00	100.00	89.54 ± 10.72

Table 2: Descriptive statistics of respondent's knowledge and perception.

Knowledge and perception of respondents on exercise practices in the management of type 2 diabetes mellitus

Table 3 shows the categorization of knowledge and perception of physicians on exercise practices in the management of type 2 diabetes mellitus. Ninety-eight percent (150) of the respondents had excellent knowledge, 0.7% (1) had very good knowledge and 1.3% (2) had good knowledge. Ninety-two percent (138) had excellent perception, 6.5% (10) had very good perception and 3.3% (5) had good perception to concerning exercise practices in the management of T2DM.

Variables	Frequency	Percentage
Knowledge		
Excellent	150	98.0
Very good	1	0.7
Good	2	1.3
Perception		
Excellent	138	90.2
Very good	10	6.5
Good	5	3.3

Table 3: Categorization of knowledge and perception of respondents on exercise practices in the management of T2DM.

Presented in table 4 is the perception of physicians on exercise practices in the management of T2DM. Physicians who were strongly confident to suggest exercise to their patients were 60.8% while 75.8% of the physicians agreed that can refer patients to physiotherapists for the appropriate exercises. 63.4% agreed that they need more information on exercises on T2DM while 43.8% disagreed that should only be concerned with prescription of drugs.

Attitudes	SA N(%)	A N(%)	U N(%)	D N(%)	SD N(%)
I have confidence to suggest exercises	93(60.8)	55(35.9)	5(3.3)	0(0.0)	0(0.0)
Do you advice patient with T2DM to do exercise	95(62.1)	51(33.3)	4(2.6)	3(2.0)	0(0.0)
What is your opinion when you see patients with T2DM doing exercises	74(48.4)	64(44.4)	14(9.2)	1(0.7)	0(0.0)
Can you refer patients with T2DM to physiotherapist for appropriate management	48(31.4)	68(44.4)	31(20.3)	6(3.9)	0(0.0)
Can you suggest exercise equipment for patients with T2DM	34(22.2)	86(56.2)	31(20.3)	2(1.3)	0(0.0)
Do you discourage patient with T2DM to visit a physiotherapist for exercise	0(0.0)	6(3.9)	22(14.4)	71(46.4)	54(35.3)
I need more information on exercises in the management of T2DM	40(26.1)	97(63.4)	4(2.6)	12(7.8)	0(0.0)
Physicians should educate patients with T2DM on importance of exercises	79(51.6)	73(47.7)	1(0.7)	0(0.0)	0(0.0)
Physicians should only be concerned with the prescription of drugs	39(25.5)	5(3.3)	2(1.3)	40(26.1)	67(43.8)
Exercise information should be for physiotherapist only	1(0.7)	7(4.6)	11(7.2)	73(47.7)	60(39.2)
Physicians should ask patients with T2DM their exercise regimen in every appointment	40(26.1)	98(64.1)	15(9.8)	0(0.0)	0(0.0)
SA- Strongly agree; A- Agree; U- Undecided; D- Disagree; SD- Strongly disagree.					

Table 4: Attitudes of respondents on exercise practices in the management of T2DM.

Association between respondent's knowledge and perception of exercise practices in the management of type 2 diabetes mellitus and each of the sociodemographic variables

Presented in table 5 is the independent t-test comparing male and female knowledge and perception. The result indicated that there was no significant difference between them (t = 0.672, p = 0.503) (t = -1.336, p = 0.184).

Table 6 shows the chi square association between knowledge and perception and each of cadre and specialty of respondents. The

result indicated that there was a significant association between respondent's knowledge and their cadre (x^2 = 32.912, p = 0.001). Also, there was a significant association between respondent's knowledge and perception and their specialty (x^2 = 164.905, p = 0.000) (x^2 = 186.362, p = 0.000).

Table 7 shows the Spearman Rho correlation between knowledge and perception and each of age, highest education level and years of experience. The result indicated that there was a significant relationship between respondent's perception and their years of experience (r = 0.296, p = 0.000).

Variables	Male (mean ± SD)	Female (mean ± SD)	t	p
Knowledge	15.31 ± 1.08	15.18 ± 1.03	0.672	0.503
Perception	8.88 ± 1.09	9.12 ± 1.03	-1.336	0.184

Table 5: Independent t-test comparing male and female Knowledge and Perception.

Variables	Excellent	Very good	Good	X^2	p
Knowledge Cadre					
Consultant	4	0	1	39.912	0.001
Medical officer	63	2	0		
Registrar	49	0	0		
Senior registrar	34	0	0		
Perception					
Consultant	5	0	0	8.402	0.753
Medical officer	60	3	2		
Registrar	41	1	7		
Senior registrar	32	1	1		
Knowledge specialty					
Internal medicine	82	0	1	164.905	0.000
Dentistry	17	1	0		
Endocrinology	16	1	0		
Anesthesia	23	0	0		
Renal	14	0	0		
Perception					
Internal medicine	80	1	2	186.362	0.000
Dentistry	13	3	1		
Endocrinology	15	1	0		
Anesthesia	18	3	2		
Renal	12	2	0		

Table 6: Chi-square test of association between respondent's knowledge and perception and each of their cadre and specialty.

Variables	Knowledge total	Knowledge percentage	Perception total	Perception percentage	Age	Highest education	Years of experience
Knowledge total	1						
Knowledge percentage	1.000**	1					

Perception total	0.351**	0.351**	1				
Perception percentage	0.351**	0.352**	1.000**	1			
Age	0.259**	0.259**	0.102	0.102	1		
Highest education	0.052	0.052	0.007	0.007	0.311**	1	
Years of experience	0.210**	0.210**	0.259**	0.259**	0.703**	0.271**	1

Table 7: Spearman Rho correlation between respondent's knowledge and perception and each of their age, highest education level and years of experience.

Association between respondent's attitude on exercise in the management of type 2 diabetes mellitus and each of the sociodemographic variables

Presented in table 8 is the Chi-square test of association between the attitude of the respondents and their cadre. The result indicated that there was no significant association between respondent's cadre and their confidence to suggest exercises (x^2 = 8.012, p = 0.784).

Presented in table 9 is the Chi-square test of association between the attitude of the respondents and their specialty. The result indicated that there was a significant relationship between respondent's specialty and their attitude for more information on exercises in patients with T2DM (x^2 = 214.531, p = 0.000). Also, there is a significance association between respondent's specialty and their attitude towards referring patient with T2DM to physiotherapist for appropriate exercises (x^2 = 203.850, p = 0.002).

Attitudes		**CO**	**MO**	**REG**	**SREG**	**X^2**	**p**
I have confidence to suggest exercises	SA	4	37	29	21	0.812	0.784
	A	1	24	17	13		
	U	0	2	3	0		
Do you advise patient with T2DM to do exercises	SA	5	38	33	19	241.780	0.149
	A	0	23	14	14		
	U	0	3	0	1		
	SD	0	1	2	0		
What is your opinion when you see patients doing exercise	SA	5	29	25	15	23.250	0.181
	A	0	29	19	16		
	U	0	7	5	2		
	SD	0	0	0	1		
Can you refer patient with T2DM to physiotherapist for appropriate exercise	SA	2	23	14	9	20.464	0.307
	A	2	23	22	21		
	U	1	18	9	3		
	SD	0	1	4	1		
Can you suggest exercise equipment for patient with T2DM	SA	3	15	9	7	28.468	0.055
	A	1	33	30	22		
	U	1	17	10	3		
	SD	0	0	0	2	16.610	0.055

Do you discourage patients with T2DM to visit a physiotherapist for exercise	A	0	3	2	1		
	U	0	13	9	0		
	D	3	31	22	15		
	SD	2	18	16	18		
I need more information on exercise in the management of T2DM	SA	2	13	16	9	24.775	0.131
	A	2	47	26	22		
	U	0	0	2	2		
	D	1	5	5	1		
Physicians should educate patients with T2DM on importance of exercises	SA	3	32	23	22	9.150	0.690
	A	2	32	26	20		
	U	0	1	0	0		
Physicians should only be concerned with prescription of drugs	SA	4	12	10	13	27.791	0.269
	A	0	4	1	0		
	U	0	2	0	0		
	D	1	34	23	9		
	SD	0	13	15	12		
Exercise information should be for physiotherapist only	SA	0	0	1	1	31.487	0.392
	A	0	4	2	1		
	U	0	7	2	2		
	D	1	35	28	9		
	SD	4	19	16	21		
Physicians should ask patients with T2DM their exercise regime in every appointment	SA	2	12	13	13	14.824	0.251
	A	3	43	31	21		
	U	0	10	5	0		
CO- Consultant; MO- Medical Officer; REG- Registrar; SREG- Senior Registrar							

Table 8: Chi-square test of association between the attitude of respondents and each of their cadre.

Attitudes	**x^2**	**p**
I have confidence to suggest exercise	109.665	0.239
Do you advise patients with T2DM to do exercise	126.636	0.884
What is your opinion when you see patients with T2DM doing exercises	241.780	0.000
Can you refer patients with T2DM to a physiotherapist for appropriate exercise	203.850	0.002
Can you suggest exercise equipment for patients with T2DM	192.167	0.011
Do you discourage patients with T2DM to visit a physiotherapist for exercise	216.662	0.000

I need more information on exercise in the management of T2DM	214.531	0.000
Physicians should educate patients with T2DM on importance of exercise	79.108	0.939
Physicians should only be concerned with the prescription of drugs	297.939	0.000
Exercise information should be for physiotherapy only	27.791	0.269
Physicians should ask patients with T2DM their exercise regimen in every appointment	133.960	0.013

Table 9: Chi-square of association between the attitude of respondents and their specialty

Discussion

This study assessed the knowledge, attitude and perception of physicians on exercise practices in the management of type 2 diabetes mellitus in Obafemi Awolowo University Teaching Hospitals Complex, Ile-Ife.

Exercise prevents diabetes and is a safe and effective treatment modality to assist in the control of glucose and reduce complications for individual with T2DM. Several systemic reviews indicate that physician's advice and counselling related to exercise practices leads to increase in exercise participation by patients, due to the fact that physicians are the first contact to T2DM patients, it is paramount that there is right knowledge, attitude and perception about the effect of exercises in the treatment regimen (Williams, 2020).

From the results of the study, it was seen that almost all the respondents had an excellent knowledge about exercise practices in the management of T2DM. This implies that there has been good awareness about the knowledge of exercise in the management of type 2 diabetes mellitus among respondents and this can be as a result of the good relationship between the physicians and other health workers. Also, technology has helped acquiring knowledge much easier through the use of search engines, online seminars and workshop. This is contrary to the findings of O'Briens., *et al.* (2017) who indicated that one of the barriers of physician counselling is lack of general knowledge on exercise practices. There was a significance association between knowledge of respondents and each of their cadre and specialty.

The study revealed that the physicians had good attitude on exercise practices in the management of T2DM. More than average respondents are confident to suggest exercise practices to their patients. This agrees with O'Briens., *et al.* (2017), who stated that increase knowledge about exercise practices will translate to increase confidence and capacity of the physicians which will allow them to incorporate exercise practices as management plan. Three-quarter of the physicians reflected a positive attitude towards referring patients with T2DM for appropriate exercises. This gives a holistic approach to the management of patients with T2DM, this finding corroboratesthe work done by Williams (2020) where most physicians agreed that they need a good knowledge on exercise because a general-physicians has a role in screening patients with type 2 diabetics who are not currently suitable for exercise program or need close monitoring and also to refer those who will benefit from exercises.

A very good number of the physicians agreed that they needed more information on exercises in the management of type 2 diabetes mellitus and more than forty percent were medical officer which buttress the significance association between physician's cadre and their knowledge. This implies that their need for more awareness of the importance of exercise in management of type 2 diabetes among the lower cadre. Majority of the physicians agreed that patients should be asked of their exercise regimen in their counselling session. This is in keeping with Williams (2020) where he mentioned that physician's continuous advice to patients concerning their exercise regimen led to increased participation by patients.

The study revealed that there is a significance association between the attitude of respondents and each of their specialty

Horny (2010) defined perception the way one thinks about something and one's idea of what it is like. The results also showed that the physicians have an excellent perception on the importance and effect of exercises practice in the multidisciplinary management of type 2 diabetes mellitus. This suggests that the respondents have seen the positive and appreciable effects of exercise practices on patients with type 2 diabetes mellitus. This finding

is in line with Ritholz., *et al.* (2011), where there was also positive perception of the physicians concerning the multidisciplinary management (involving medication, exercise, diet) of T2DM.

This study showed that there was a significant association between perception of respondent and each of their specialty and years of experience.

Conclusion

The study shows that the respondents (physicians) are favorably disposed to exercise practices in managing T2DM in OAUTHC, Ile-Ife, Osun state. This helps curtail the ugly trend of surge in T2DM by reducing the incidence and improving management outcome through exercise practice as recommended by physicians.

Conflicts of Ethics

Nil.

Conflicts of Interest

Nil.

GDPR Consideration

Nil.

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