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A Knowledge, attitude and practice of diabetic patients regarding obesity hazards:

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ABSTRACT

Background: There's few studies from Libya assessing the level of Knowledge, attitude and Practice of diabetic patients toward the hazards of Obesity. Evidence from several studies indicates that obesity and weight gain are associated with an increased risk of diabetes (Jafar *et al.,* 2006). Weight reduction has been shown to markedly improve blood glucose control and vascular risk factors associated with insulin resistance in obese individuals with DM (Andre, 2003). ***Methods:*** It was a cross sectional study involving 308 diabetic patients from the outpatient department of Sidi-Hussein Diabetic clinic in Benghazi-Libya. A questionnaire was constructed in English language by the researcher. Each patient was interviewed by an intern doctor in a private setting. Abdominal circumference, body weight and height of the individuals were measured. Body mass index "BMI" was calculated. Data analyzed by SPSS 21.0 for Windows and chai-square was done when appropriate. ***Result:*** Among them 35.7% were male, 64.7% were female, 26.5% were illiterate, 83.1% were married and 89.5% were non-smokers. Obesity was found in 36.3% of male and 68.1% of female. Overall 57.2% of male patients have high abdominal circumference (>=102), while 65.1% of female patients have high abdominal circumference measurements (>=88). BMI was significantly associated with patient's gender (P=0.000) and occupation (P=0.010). ***Conclusion:*** There's an increase need for making more educational programs focusing on hazards of obesity among the diabetic patients to empower them to transfer their knowledge, attitude and practice. The health care community, researchers and policy makers need more attention toward obesity among diabetic patients in Libya. ***Recommendations:*** There is a need for developing and making education programs focusing on the knowledge, attitude and practice of the diabetic patients about hazard of obesity. Improving knowledge of the patient will delay the onset of complications of their diabetes.

Keywords: diabetic, attitude, Practice, Obesity, male, female.

Introduction

Obesity is a global epidemic resulting in major morbidity and mortality. It's is becoming a major public health problem all over the world due to its link with diabetes, hypertension, cardiovascular disease and other disorders related to metabolic syndrome. Developing countries are increasingly vulnerable to the worldwide epidemic of obesity, which affects all segments of the population, including men, women and now children (Friedrich, 2002 ; Galal and Hulett, 2005).

Compared with populations in industrialized countries, those in the developing world appear to be at greater risk of the diseases associated with overweight (Reddy, 2004 and He *et al.,* 2005). Cardiovascular disease in non-Western countries. Several studies, showed that there is a significant association between higher body mass index (BMI) and incidence of diabetes mellitus (Salmeron *et al.,* 1997). Social, environmental and the rapid lifestyle nowadays resulted in changing our nutritional habits to higher calorie diets in addition to little physical activity which might have contributed to the increasing prevalence of diabetes (Ahmed *et al.,* 2004). Several lifestyle factors affect the incidence of diabetes. Obesity and weight gain dramatically increase the risk (Colditz *et al.,* 1995), physical inactivity (Lynch *et al.,* 1996 and Hu *et al.* 1999), Cigarette smoking (Manson *et al.,* 2000) further elevates the risk, in addition, a low fiber diet with a high glycemic index has been associated with an

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increased risk of diabetes (Salmeron *et al.,* 1997 and Liu *et al.,* 2000). And may differentially affect insulin resistance (Dietary, 2000 and Hu *et al.,* 2001). Although the exact mechanisms through which obesity increases the risk of diabetes are not fully understood, obesity results in insulin resistance, a state that is also characteristic of impaired glucose tolerance and NIDDM (Reaven, 1988). In addition, obesity is often associated with increased insulin production by pancreatic cells. further deterioration in glucose homeostatic mechanisms occurs when beta-cells become glucose incompetent and clinical diabetes develops (Unger, 1995). Diabetic patients receive, as part of their treatment, the recommendation to lose weight. A weight loss improves insulin sensitivity and metabolic control as testified by lower glucose and HbA1c levels (Wing *et al.,* 1994). Complications of diabetes increased among obese diabetic patients. However, changes in lifestyle habits which lead to weight loss reduce the incidence of the disease and its complications (Hossain *et al.,* 2007 and Maina *et al.,* 2010). Each year an estimated 300000 us adults die of causes related to obesity and DM (Allison *et al.,* 1999). About 64% of Libyan adults are either overweight or obese, obesity progressively increasing with age, and two times more common among Libyan women than men (Elmehdawi and Albarsha, 2012). Management of obesity largely depends on patient awareness, education and willingness to change. These, in turn, require baseline data on the knowledge, attitude and practice (KAP) of patients. Knowledge is influenced by socioeconomic and cultural factors, Attitude depends on patient's readiness to learn and family support (Murata *et al.,* 2003). Since socioeconomic and cultural factors are strong elements of KAP (Connoly *et al.,* 2000). More studies and researches are needed in our community. Very few studies have been performed on these issues particularly in developing countries like Benghazi. The aim of the present study was to assess KAP on obesity diabetic patients, knowledge, attitude and practice on hazards of obesity among Libyan diabetic patient in Sidi-Hussein diabetic Clinic in Benghazi-Libya.

Materials and Methods

"Study in Sidi Hussein diabetic clinic" in Benghazi-Libya. "October 2016" Study settings and Participants: An interviewer-patient questionnaire assessed the knowledge, attitude and practice of the subjects. All interviews were administrated in Out Patient Department setting in Sidi-Hussein diabetic clinic in Benghazi. The subjects of this study were selected from OPD at date interval of 15 to 20 October 2016. Under a cross-sectional design study, a total of 308 patients agreed to participate (198 women, 110 men) answered the questionnaire. A questionnaire was constructed in English language and interview was done by an intern doctor. Questionnaire: A one-paper four-part questionnaire was formed by the researcher in English language to obtain basic data regarding awareness, knowledge, beliefs, treatment and other issues. The first part of the questionnaire consisted of a brief socio-demographic information included Number of patient's card, age, gender, education level, occupation, smoking and marital status. Part two covered knowledge about obesity included, abdominal circumference, weight and height measurements, steps to control obesity, healthy foods, daily food intake and knowledge about obesity and its hazards. Part three of the questionnaire assessed the attitude of the respondents towards lifestyle characteristics such as nutritional habits, physical activity, ideal body weight and diabetes complication and medical treatment. Part four focused on steps taken to prevent obesity, weight management, calorie and food intake, physical activity, diabetes control and nutritionist follow-up. Measurements: Height and abdominal circumference was measured by a tape measure, weight was measured in light clothing by a HOMMER electronic scale. Body mass index (BMI) (in kg/m2) was calculated. The World Health Organization (WHO/FAO, 2003) classification of BMI categories was used to segregate and identify overweight and obese patients (WHO/FAO, 2003). Obesity was defined as a BMI is 30 and above whereas Overweight was defined as a BMI of 25 to 29.9. central obesity was defined as a waist circumference of 102 cm or higher in men and 88cm or higher in women. Last HbA1c reading was recorded from the patients to assess their diabetes control. Statistical analysis: The data analysis was done by using the Statistical Package for Social Science (SPSS) version 21.0. The data were analyzed using Pearson's chi-squared statistic and were considered significant at a level of ≤ 0.05

Results

Table1, shows the general characteristics of the patients. Total number of study subjects were 308 diabetic patients, Majority (79.7%) were between 45 to 74 years of old. Among them were (64.3%) females, (83.1%) were married and the majority (70.9%) of male genre were non-smokers. Figure1, shows (26.5%) were illiterate, (41.2%) had primary education, (16%) had secondary education and (16.4%) had graduated collage or above. There's highly significance between gender and educational level (P=0.000), only 10% of males found to be illiterate while more than one third (35.7%) of females were illiterate. More than half of the patients (58.6%) had manual jobs that includes the house wives' genre, Manual jobs where highly significant according to gender too. Sgnificance between gender and education level (in Sidi-Hussein clinic. Benghazi Oct.-2016). Pearson Chi-Square 37.138 a 5 .000

Significance between gender and occupation (in Sidi-Hussein clinic. Benghazi Oct.-2016). Pearson Chi-Square 124.177 a 2 .000

Table 1: General Characteristics of the study subjects (in Sidi-Hussein clinic. Benghazi Oct.-2016). N=308

Characteristics subjects	Category	Number	%
Age	<45	43	13.9%
	45-59	133	43.1%
	60-74	111	36.3%
	>=75	21	6.7%
Gender	Male	110	35.7%
	female	198	64.3%
Education	Illiterate	81	26.4%
	Elementary	58	18.8%
	Preparatory	68	22.1%
	Secondary school	49	15.9%
	University graduate	48	15.6%
	Post graduate	4	1.2%
Occupation	manual	178	57.8
	non-manual 41.1%	130	42.2
Marital status	Single	15	4.9%
	Married	256	83.1%
	Divorced	5	1.6%
	widower	32	10.4%

Table 2, shows the BMI of the patients according to gender. In this study, BMI found highly significant to gender (P=0.000). Majority of female patients (72.2%), while only (36.7%) of males were obese as also shown in figure3. The morbid obesity (BMI 40 or more) is (7.34%) males while it's doubled among females (15.5%).

Table 2: BMI, Abdominal circumference and if one think he's/she's overweight according to gender (in Sidi-Hussein clinic. Benghazi oct-2016). N=308

		Males no=110		Females no=198	
		Number	%	Number	%
Body mass index (BMI)	<18.5	2	1.8	1	0.5
	18.5-24.9	23	20.9	21	10.6
	25-29.9	45	40.9	35	17.7
	30-34.9	26	23.6	69	34.8
	35.39.9	6	5.5	42	21.2
	>=40	8	7.3	30	15.2
Abdominal obesity	Present	63	57.3	129	65.2
	absent	47	42.7	69	34.8
You think you're overweight?	Yes	39	35.5	108	54.5
	No	71	64.5	90	45.5

More than half of males (57%) were classified as having central obesity while most of females (65%) having the same problem. There's highly significance between BMI and if the patient think he's/she's overweight or not (P=0.000). Only two thirds of diabetic patients (67%) think they're overweight. Significance between BMI and gender (in Sidi-Hussein clinic. Benghazi oct2016). Pearson Chi-Square 39.883a 5.000. Significance between do you think you're overweight and gender (in SidiHussein clinic. Benghazi oct-2016). Pearson Chi-Square 11.487a 1 .001

Table 3, shows the knowledge regarding obesity among the study subjects, only half the patients from both sexes (56.4%) males and (55.2%)females think that obesity may cause DM, nearly all patients (98.2%)males and (97.4%) females think diet and exercise are the best solution for obesity. Majority of the respondents (75.7%) males and (71.2%) females claims they're aware of obesity hazards. Only (32.7%) males and (56.8%) females think we have an efficient health education in our community. It's highly significant (P=0.000). Significance between health education and gender (in Sidi-Hussein clinic. Benghazi oct-2016). Chi-Square Tests Value df Asymp. Sig. (2-sided Pearson Chi-Square 16.958a 2

Table 3: Knowledge regarding obesity (in Sidi-Hussein clinic. Benghazi oct-2016).

		Males no=110		Females no=198	
		Number	**%**	**Number**	**%**
Obesity cause DM?	YES	62	56.4	107	54
	NO	48	43.6	91	46
Best solution for obesity?	surgical	2	1.8	8	4
	Diet & exercise	108	98.2	190	96
Aware of obesity hazards?	YES	83	75.5	141	71.2
	NO	27	24.5	57	28.8
Have health education at clinic?	YES	36	32.7	112	56.6
	NO	74	67.3	86	43.4

Table 4, assess the attitude of patients, nearly two thirds (65.7%) males and (73.7%) females are doing exercise less than 3 hours a week. (38.7%) males and (51.6%) females are having more than 5 meals per day, but less than half of patients (47.3%) males and (24.4%) females are having fruits and vegetables more than 3 times per week. There's significance (P=0.006) between having obese relatives in the family and gender, (35.5%) males and (50.5%) females are having obese relatives in their family.

Table 4: Attitude regarding obesity (in Sidi-Hussein clinic. Benghazi oct-2016

		Males no=110		Females no=198	
		Number	**%**	**Number**	**%**
Exercise?	<3hrs/wk	72	65.4	145	73.2
	3-5hr/wk	28	25.5	42	21.2
	>5hrs/wk	10	9.1	11	5.6
Number of meals/day?	Less than 3	7	6.4	17	8.6
	3-4	57	51.8	68	34.3
	5 and above	46	41.8	113	57.1
Fruits & veg. per week	<3hrs/wk	23	20.9	50	25.3
	1-3	35	31.8	99	50
	>5hrs/wk	52	47.3	49	24.7

Table 5, shows the PRACTICE of patiens, only (15.7%) males and (23.6%) females are on a diet. Avery small percent (9%) males and (14.9%) females follow up with a nutritionist. The results in table 6 found that, significance between associated chronic disease and gender (in Sidi-Hussein clinic. Benghazi oct-2016.(Value d f Asymp. Sig. (2-sided Pearson Chi-Square 22.373a 7 p .002.

Table 5: Practice of patients (in Sidi-Hussein clinic. Benghazi oct-2016

		Males no=110		Females no=198	
		Number	%	Number	%
Are you on a diet program?	Yes	18	16.4	46	23.2
	No	92	83.6	152	76.8
Follow up nutritionist?	Yes	10	9.1	30	15.2
	No	100	90.9	168	84.8

Table 6, will assess the complications and CONTROL of problem according to gender. There's significance between gender and associated Ch. Illnesses, as for male gender, (50%) are not having any Ch. Illnesses, (16.4%) with hypertension, (5.77%)with ischemic heart disease and (13.5%) having more than one illness. For females, (37%) don't have any Ch. illnesses, (32.3%) are having more than one disease, (18%) with hypertension and (5.8%) with osteoarthritis. Nearly half of the patients, (45.5%) males and (48.5%) are on insulin injections and Metformin tablets. Nearly (43.6%)males and (50.5%) females are having good control over their disease.

Table 6: Complications and control of DM according to gender (in Sidi-Hussein clinic.oct-2016

		Males no=110		Females no=198	
		Number	%	Number	%
Associated chronic diseases	Hypertension	17	15.4	34	17.2
	Ischemic heart d	1	0.9	6	3
	Dyspnea	5	4.5	6	3
	Osteoarthritis	4	3.6	11	5.6
	Difficulty of sleep	1	0.9	2	1
Treatment of diabetes ?	Pills and diet	43	39	70	35.3
	Pills and insulin	50	45.5	96	48.4
	Insulin	17	15.5	32	16.3
Last HbA1c?	Less than 7	36	32.7	59	29.8
	7-8	48	43.6	100	50.5
	More than 8	26	23.7	39	19.7

Discussion

The epidemic of obesity is not limited to Libya, but it is a global problem. Obesity is much more prevalent among Libyan women than men, and it increases progressively with age in both sexes. The management of diabetes and its associated health-risk factors are often complex and require efficient patient education and medical monitoring (Koopmanschap, 2002) patients are the most important decision makers, they should receive enough instruction to make informed decisions about prevention and management. (Murata *et al.,* 2003). Education can be more effective when it is educated according to knowledge, attitude and practice of patients. However, unfortunately there's not enough studies on KAP of diabetic patients regarding obesity in our country .

In another study, approved that a combination of several lifestyle factors, including a BMI of 25 or less, eating a diet high in fiber and low in fats and SUGARY FOOD, exercising regularly and abstaining from smoking, lower the incidence of type 2 diabetes approximately 90 percent than that found among women without these factors. These results suggest that in this population the majority of cases of type 2 diabetes could be avoided by behavior modification (Frank *et al.,* 2001).

In our study, it was noticeable that majority of the respondents (78%) were 45 and more years of old, which reflects that it's a disease of middle to old age. Most of male and female were doing manual jobs –that includes the house wives' genre-. It is matter of concern that majority of females and more than third of males' respondents are obese and among them the proportion of female is higher than male, maybe due to the access to information or lack of awareness. Thus, this group should be targeted for the intervention .In previous study, Exclusive breast-feeding during the first months of infancy reduces the risk of overweight in childhood In Libya, the rate of artificial feeding is nearly 40.3% (Baccush and Nayak, 1992) and 47.88% of mothers breast-feed their infants for less than 1 month. This partially explain the high rate of obesity in children aged 5 or younger now in Libya (MHL. 2008). Pan Arab project for family health. National Survey of Family Health. Tripoli: Ministry of Health-Libya and therefore obese children become obese adults. Moreover, majority of

the participants of our study had good knowledge regarding obesity. We found more than half percent 56.4% males and 55.2% females think that DM not caused by obesity, almost all of them think healthy diet and exercise are the best solution for obesity. More than two thirds are aware of obesity hazard. If we could transfer this knowledge into practice, then healthy body weight could be achieved. However, as knowledge alone is insufficient: Pan *et al.* (1997) proposed other factors such as attitude and motivation are also important .

Unfortunately, nearly third of males and half of females think we have an efficient health education in our community .On the other hand, participants were asked about food intake, exercise and obese relatives in the family to assess attitude toward obesity. More than half of patients of both sexes were eating fresh fruits and vegetables less than 3 times per week. Moreover, most of patients of both sexes are having more than 3 meals per day. Adding to that the majority of patients are having exercise of less than 3 hours per week, such eating preferences and lifestyle habits adds to the development of overweight and obesity among patients .

A Libyan study, about 44% of Libyan adults do not get sufficient exercise (51.7% of women and 36% of men) (MHL, 2009). We think this is mainly because of increasing dependence on mechanical transportation and greater availability of effort-saving equipments domestically. Also, the increase in television viewing time, use of computers and video games could be other possible contributors to the rise in the prevalence of obesity in Libyan children and adults .

In previous studies, Evidence suggests that reduction in the intake of fat and sugar lead to body weight control and prevent overweight and obesity (MHL 2008) in other study, it has been shown that reduced level of physical activity play a predominant role in the development of obesity (Maghoub and Stephens, 1979). Clinical trials in China and Finland have demonstrated the feasibility and efficacy of lifestyle-intervention programs in the prevention of diabetes in high-risk populations. Among 577 patients with DM in China. (MHL, 2009) exercise, dietary interventions or both resulted in a decrease of 42 46% in the rate of progression of DM during six years of follow-up. Recently, the Finnish Diabetes Prevention Program reported that the modification of lifestyle reduced the incidence of NIDM by 58% during 3 years of follow-up among 522 overweight participants with NIDM. (Tuomilehto *et al.,* 2001 and Webber, 2003) Results from the Diabetes Prevention Program in the United States also show that regular exercise and the modification of diet reduced the incidence of diabetes by 58% among the diabetic patients (PNIDDKD, 2001). This study also debates the social health gradient (obesity hazard to diabetes), those patients believe they can eat anything while use insulin, so we should development the awareness of dietary habit .

In our study, the practice of patients also found poor. Only small percent of patients have a proper diet and follow up with a nutritionist .The Libyan diet, which is high in calories and rich in fat, and the lack of physical activity play an important role in the current obesity epidemic in Libya. With its known significant morbidity and mortality, (Qidwai and Azam, 2004) obesity should draw the attention of the healthcare community, researchers, and policy makers in Libya. The prevalence of obesity in Libya is very high in both adults and children, and it has increased dramatically since 1984. (Saris, 2003). Food and Agriculture Organization (FAO) analysis of yearly production, import and consumption shows that the staple Libyan diet is wheat (bread, couscous, and pasta). Rice is another major staple in Libya (FAO/UN, 2005). The Libyan diet is low in vegetables and fruits (Harder *et al.,* 2005 and MHL, 2009). In 2001, according to the FAO, the proportions of main energy sources in the Libyan diet were 62% of carbohydrates, 27% of fat, and 11% of proteins (Jafar and Gregory, 2006). All the previous studies indicate that our community's diet habits contribute in the obesity problem and therefore increase the incidence and complications of the diabetic patients. Moreover, it has to be remembered that obesity usually clusters with several cardiovascular risk factors such as dyslipidemia, procoagulant state, inflammatory cytokines, etc, which may contribute to increasing the risk of mortality (Krauss *et al.,* 1998 and Sweileh *et al.,* 2014).

Our study confirmed the findings of two previous studies in the Libyan diabetes context (Roaeid and Kablan, 2007 and Elkharam *et al.,* 2013). In a large diabetes care center in Benghazi, (Roaeid and Kablan, 2007) reported that (27.1%) of diabetics were not taking their medications regularly. In a more recent study in the same center in Benghazi, Elkharam *et al.* (2013) assessed diabetic patients' management plan using HbA1c, and their findings also reflected the problem. Both two studies used different measures and reflects the same conclusion.

The lack of proper knowledge about diet requirements of each patient should be considered in making solutions, so patients can understand and follow it in practice. Improving knowledge of the patient can improve their attitude and in long run change their practices to embrace healthier lifestyles such as following healthy diet and engaging in physical activity. Such practices will delay the onset of further complications in those who are diabetic.

Recommendations

There's need to make more health education toward obesity hazards directed to all our community in general and diabetics in specific. 2. Each diabetic patient should be given individual dietary advices with clear view to its purpose, so they can understand and follow it in practice. 3. Special and more advanced diabetic centers should be constructed in our community to offer service to each patient including height and weight measurements, follow up with a nutritionist, exercise areas, lecture rooms to educate diabetics about their disease and its complication. A fully equipped OPD and Emergency room to receive patients.

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