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RESEARCH ARTICLE

IMPACT OF HEALTH EDUCATION ON QUALITY OF LIFE IN EGYPTIAN TYPE 2 DIABETIC PATIENTS.

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Abstract

Background and Aim: Diabetes mellitus is a highly prevalent worldwide chronic disease with a well-known impact on quality of life (QoL). This study aims atassessingQoL in Egyptian type 2 diabetes patients and impact of health education intervention on QoL.
Methods*:* An interventional study was carried out on 480 type 2 diabetics, aged 30-65 years, in Zagazig University hospital, Sharkia Governorate during the period from February 2016 to March 2017 using systematic random sampling. QoL was measured before and after health education usingWHOQoL-BREFinstrument (the Arabic version 1997).
Results*:* 230 (47.9%) of the patients reported no comorbidities. Hypertension was the most frequent (31.3%) comorbidity. 45.5% of diabetic males were impotent. Although58.3% of the studied group had a score >50 in the physical domain of QoL, 60.4% had score < 50 in the psychological and social domain, and 58.3% had score < 50 in the environmental domain and total score of QoL.Age ≤ 50 years, duration of disease ≤ 10 years, and adequate knowledge were associated with higher total QoL ($p=\leq 0.02$). Significant improvement in physical, psychological domain and total QoL was found ($p<0.05$) after one year of health education intervention.
Conclusion*:* A poor QoL was evident among type 2 diabetics in all its domains except the physical domain.The applied health education intervention message was an effective tool in improving QoL.

Introduction:-

The prevalence of diabetes mellitus (DM) is increasing all over the world. In 2013, DM has reached an alarming figure, with at least 8.3% of the global population, or approximately 382 million people, affected. This prevalence is anticipated to rise to upwards of 552 million (9.9%) by 2030 (Federation ID, 2013).

The 2010 International Diabetes Federation (IDF) statistics for type 2 diabetes prevalence in developed and developing countries showed that 9.1% of the populations from the Middle East and North Africa regions had type 2 diabetes (32.8 million) in 2011, and were expected to reach sixty million in 2030. The explosion of type 2 diabetes in this region, within the 20–79 age groups, has led to about 280,000 yearly deaths in the Middle East and North

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Africa regions, with mortality resulted from diabetes being equal in males (141,000) and females (138,000). About fifty percent of mortality related to diabetes in this region occurs in patients under the age of sixty years (Sreedevi et., 2016). In Egypt, the comparative diabetes prevalence was 16.9% with 3,123,700 affected adult males and 4,199,500 affected adult females (Whiting et al, 2011).

Diabetes leads to huge economical costs mainly caused by debilitating micro- and macro-vascular complications and is a burdensome disease that can seriously impair the quality of patient's life (Davies et al., 2008). Hyper/hypoglycemia may also adversely influence QoL (Testa and Simonson, 1998), also; the depression in these patients (Goldney et al., 2004). Prove demonstrates that patients with diabetes have bring down QoL than non-diabetic people (Thommasen et al., 2005).

Quality of life (QoL) identification is one of the lifestyle analysis methods, which are considered the most important aspect in primary and secondary prevention of many non-transmissible chronic diseases such as diabetes, hypertension, coronary heart disease, cancer (Warburton et al., 2006; WHO J and Consultation FE 2003).

World Health Organization (WHO) defines QoL as "an individual's perception of their position in life in the context of the culture and value systems in which they live in relation to their goals, expectations, standards and concerns" (The World Health Organization Quality of Life Assessment, 1998). It is a broad idea impacted by various physical, psychological, social, and environmental variables (Alavi et al., 2007).

QoL is considered as a marker to evaluate the impact of chronic diseases on patients' lives, and also to assess the effectiveness of the treatments and caring programs (Aghakoochak et al., 2014).

As ethnicity, culture, beliefs, and social realities moderate the perception of the patients about their illness (Sreedevi et al., 2016). So; this study was aiming to assessthe QoL in Egyptian type 2 diabetics and the impact of health education intervention.

Subjects And Methods:-

Technical Design;-

Study design, settings, and Duration:-

Interventional study (health education) carried out on diabetic patients in Zagazig University Hospitals, Sharkia Governorate during the period from February 2016 to March 2017.

Subjects:

Cases recruited from diabetes clinic in Internal Medicine department. Each patient rechecked every three months. *Inclusion Criteria* included type 2 diabetic patients with age ranges from 30 to 60 years old and both genders. *Exclusion criteria* included people with chronic and painful health conditions like cancer, spine injury, and psychiatric morbidity.

Sampling size and technique:-

According to the pilot study, the estimated sample size was 480 patients at 80% power and 95% Confidence Interval(CI) (Epi info version 6). Systematic random sample, obtained after the acceptance of patients to share in the study and with the support of the headmaster of the internal medicine department, targeting eight patients per day out of those attending the clinic, the sampling interval was every fourth or fifth patient from the list of patients who presented at the clinic.

Operational Design:-

Data Collection:-

First: a pilot study conducted, to assess the feasibility and the time needed to fill the questionnaire and to carry out health education, on 100 patients who attended diabetes outpatient clinic (excluded from the main study sample). Data obtained from the pilot study analyzed and accordingly necessary modifications in the questionnaire, health education message and the way of its delivery were done. The time needed for filling the sheet was about 40 minutes and the time needed for delivery of health education message was about 20 minutes. Difficult and unclear questions modified into easier and clearer ones.

Second: The data were collected by an interview questionnaire as the following;

a) First stage (pre-intervention stage) which contains
- Form a(Data collection sheet for type 2 diabetics) that includes socio-demographic characteristics, history of diabetes, symptoms, associated health problems, compliance to treatment, and activities of daily living (ADL).
- Form b: (Diabetes Knowledge Questionnaire) included 11 multiple choice questions on knowledge about diabetes. Each question scored as two or zero for a correct or wrong answer, respectively. A score of one given to an answer of "I do not know". The lowest knowledge score was zero and the highest was twenty-two. Total score equal to 11 or more considered adequate knowledge, and less than 11 considered inadequate knowledge.
- Form c: WHOQoL-BREF scale Arabic version (Ohaeria and Awadalla 2009) that includes 26 questions reflecting four domains; physical health (seven questions), psychological status (six questions), social relationships (three questions), and environmental (eight questions). There were two global scores of overall QoL (one question) and overall satisfaction with health (one question). The raw scores of each domain were converted to transformed scores from 0-100 scale, where 100 is the highest and 0 is the lowest in the quality of life. Total domain score equal to 50 or more considered good, and less than 50 considered bad.

b) Second stage (intervention stage) health education sessions in verbal form and posters, about 20-30 minute every three months, to increase knowledge about diabetes (definition, risk factor, causes, clinical picture, acute and chronic complications of diabetes and treatment).

c) Third stage (post-intervention stage) three months after implementation of the health education message, the same group was asked the same questionnaire that was used in pre-test to detect the effect of health education.

Anthropometric measures: Height and weight were measured to calculate body mass index (BMI) according to formula [Weight (Kg)/Height (m^2)] and waist circumference was measured to assess body fat distribution.
Laboratory Investigations: Random blood sugar, Hemoglobin A_1c.

Data Management:-
The collected data were analyzed by using Statistical Package for the Social Sciences (SPSS version 20) as descriptive analysis, frequency distribution and cross-tabulation. Mc Nemer test, Chi-square test and t test were used when appropriate. The results were considered statistically significant when the significant probability ($p < 0.05$).

Ethical Considerations:-
All procedures were conducted in accordance with the ethicalprinciples expressed in the Declaration of Helsinki. Written informedconsents were obtained from all patients. Approval by IRB researchcommittee of Zagazig Faculty of Medicine was included.

Results:-

Socio demographic features shows that 77.1% of the patients were females, 54.2% above fifty years old, 64.6% live in urban area, 72.9% not educated, 75% married, 77.1% not working, 81.3% nonsmokers, 91.7% mentioned that they had insufficient income, 54.2% had no family history of diabetes, 79.2% had duration of diabetes ≤10 years, 52.1% take their treatment more than 5 years, and 52.1% receive insulin as a treatment ***(table 1)***.

Hypertension was the most frequent health problem (31.3%) in overall diabetic patients. Impotence occurred in 45.5% of diabetic males ***(table 2)***.

Adequate knowledge about diabetes mellitus was associated with controlled diabetes. Patients who had foot ulcer, neuropathy and arthralgia were found to have inadequate knowledge about diabetes ***(table 3)***.

More than half of patients had a bad score in all QoL domains except for the physical domain ***(table 4)***.

Diabetic patients ≤50 years old with a disease duration ≤ 10 years and adequate knowledge had a higher total QoL score ***(table 5)***.

Health education intervention program resulted into significant improvement in the score of physical and psychological domains of QoL, and total QoL score. However, social and environmental domains score were not significantly affected ***(table 6)***.

Table 1:-Socio demographic features.

		Number	%
Gender	Male	110	22.9
	Female	370	77.1
Age	≤ 50 years	220	45.8
	> 50 years	260	54.2
Residence	Rural	170	35.4
	Urban	310	64.6
Education	Non educated	350	72.9
	Educated	130	27.1
Marital status	Married	360	75.0
	Unmarried	120	25.0
Job status	Working	110	22.9
	Not working	370	77.1
Smoking	Smoker	90	18.8
	Non smoker	390	81.3
Income satisfaction	Satisfied	40	8.3
	Non satisfied	440	91.7
Family history	Positive	220	45.8
	Negative	260	54.2
Duration of diabetes	≤ 10 years	380	79.2
	> 10 years	100	20.8
Duration of treatment	≤ 5 years	230	47.9
	> 5 years	250	52.1
Type of treatment	Oral hypoglycemic	190	39.6
	Insulin	250	52.1
	Combined	40	8.3

Table 2:-Distribution of associated health problems.

Health problems	**Frequency**	**%**
No associated health problem	230	47.9
hypertension	150	31.3
Cardiac problems	30	6.3
Chest problems	10	2.1
Hepatitis	20	4.2
Varicose vein	30	6.3
Rheumatoid arthritis	10	2.1
Health problems in Males	**Frequency**	**%**
Impotence	50	45.5

Table 3:- Relation between total knowledge score and the control of diabetes mellitus plus and the occurrence of complication

	Total	**Adequate knowledge (score ≥ 11)**		**Inadequate knowledge (score < 11)**		**X^2**	**P**
		Number	**%**	**Number**	**%**		
Controlled Diabetes	11	9	81.8	2	18.2	4.39	**0.036**
Uncontrolled Diabetes	37	17	45.9	20	54.1		
Cataract	7	2	28.6	5	71.4	1.12	0.29
Retinopathy	9	3	33.3	6	66.7	1.04	0.3
Nephropathy	10	5	50.0	5	50.0	0.0	1.0
Foot ulcer	12	3	25.0	9	75.0	5.02	**0.024**

Neuropathy	22	8	36.4	14	63.6	5.19	**0.02**
Arthralgia	38	18	47.4	20	52.6	7.79	**0.02**

N.B: Chi-square test of significance

Table 4:-Distribution of quality of life domains.

Domains	**QoL score**			
	< 50	**%**	**≥ 50**	**%**
Physical	200	41.7	280	58.3
Psychological	290	60.4	190	39.6
Social	290	60.4	190	39.6
Environmental	280	58.3	200	41.7
Over all QoL score	280	58.3	200	41.7

Table 5:-Relation of total quality of life score with some demographic and clinical variables

		Total	**Total QoL score**				**X^2**	**P**
			< 50	**%**	**≥ 50**	**%**		
Gender	Male	110	70	63.6	40	36.4	0.17	0.68
	Female	370	210	56.8	160	43.2		
Age	≤ 50 years	220	90	40.9	130	59.1	5.07	**0.02**
	> 50 years	260	190	73.1	70	26.9		
Residence	Urban	170	120	70.6	50	29.4	1.63	0.2
	Rural	310	160	51.6	150	48.4		
Education	Illiterate	350	210	60.0	140	40.0	0.15	0.7
	Educated	130	70	53.8	60	46.2		
Marital	Married	360	200	55.6	160	49.4	0.46	0.49
	Unmarried	120	80	66.7	40	33.3		
Duration of Disease	≤ 10 years	380	190	50.0	190	50.0	5.21	**0.02**
	> 10 years	100	90	90.0	10	10.0		
Duration of Treatment	≤ 5 years	230	140	60.9	90	39.1	0.12	0.73
	> 5 years	250	140	56.0	110	44.0		
Knowledge	Inadequate	22	17	72.3	5	22.7	5.99	**0.014**
	Adequate	26	11	42.3	15	57.7		

N.B: Chi-square test of significance

Table 6:-Changes in quality of life domains score after health education intervention

Domains		**Base line**		**After one year of health education**		**p**
		Number	**%**	**Number**	**%**	
Physical	< 50	200	41.7	150	31.3	**< 0.05**
	≥ 50	280	58.3	330	68.8	
Psychological	< 50	290	60.4	250	52.1	**< 0.05**
	≥ 50	190	39.6	230	47.9	
Social	< 50	290	60.4	270	56.3	> 0.05
	≥ 50	190	39.6	210	43.8	
Environmental	< 50	280	58.3	260	54.2	> 0.05
	≥ 50	200	41.7	220	45.8	
T QOL	< 50	280	58.3	220	45.8	**< 0.05**
	≥ 50	200	41.7	260	54.2	

N.B: McNemar test of significance.

Discussion:-

The present work was done to survey QoLin Egyptiantype2DM patients, to identify the most important determinants affecting their QoL, and to measure the impact of diabetes health education intervention on QoL.

The majority of the studied diabetics were females (77.1%), it could be explained by the high susceptibility of females to different diseases and due to their numerous participations; as a housewife, a mother, and probably an employee; in the society. The duration of illness was ≤ 10 years in the larger part of the studied subjects (79.2%), most of the diabetics studied aged between 30 to 65 years. Similar characteristics found in other studies(Ferrannini et al, 2014; Riaz et al, 2013; Adham et al, 2010)

On checking the hospital medical files of the study population, the most obvious overall co morbidity was hypertension (31.3%) as a part of metabolic syndrome in these patients. In the male study group, 45.5% of them were impotent. Poor potency was alsoannounced among diabetics studied in Cairo in Egypt by Awad et al., 2010, where it accounted for 50% among male diabetics and the other half had good (25%) and fair potency (25%) (Awad et al., 2010).

Foot ulcers, neuropathy and arthralgia were significantly lower in cases with adequate knowledge about diabetes. A study in India also showed that education for foot care in diabetics in primary care settings reduced the burden of foot ulcers (Saurabh et al., 2014).

Analysis of QoL questions revealed that more than fifty percent of patients had a bad score in all domains of QoL except physical domain, supporting some of the findings of Moraveji, 2012, where physical domain was 49.1% and psychological domain was 50.3%, however; not in social domain (9.9%) or environmental domain (17.4%) (Moraveji, 2012). Also; these results confirmed the results of Sreedevi et al., 2016; except for physical domain; who found that the percentage of patients with good quality of life was low and varied from 7% to 17% in the physical, psychological, and social domains (Sreedevi et al., 2016). This can be explained by a variety of reasons that might inflence the diffrences in results, like cultural and contextual issues, differences in peoples' socio-demographic characteristics, the different features of the disease in different people.

Old age played a role in worsening of QoL in our study, which was the same in Eljedi et al., 2006 study, who found that age reduced QoL more obvious in older age groups than younger age groups (Eljedi et al., 2006).

On the contrary to Sreedevi et al., 2016, who found that education was an independent determinant of good QoL in all the domains except social, explaining this by the fact that education reduces distress largely by way of paid work, non-alienated
work, and economic resources, which are associated with high personal control. In our study level of education had no effect on QoL score and this point needs more validation for the cause of indifference in further studies (Sreedevi et al., 2016).

Also; QoL was affected by, the duration of disease and the adequacy of knowledge about DM. Longer duration of DM and inadequate knowledge lower the QoL of diabetics in the current study, affirming what Kalda et al., 2008 said about the most affecting factors on QoL, which were the extent of the patient's awareness about the complications and risk factors of diabetes, age, duration of disease, and BMI (Kalda et al., 2008),andDidarloo and Alizadeh 2016, who found that females with diabetes and high knowledge regarding diabetes experienced high physical health and social relationship in comparison with others (Didarloo and Alizadeh, 2016).

In the present study, there is a significant impact of health education intervention on both physical and psychological domain and hence total QoL, supporting the results of other studies (Jahromi et al., 2015; Didarloo et al., 2016), but; not in social and environmental and this may be referred to the different political and social atmosphere.

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Footnotes:-

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