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RESEARCH ARTICLE

DOES GENDER AFFECT KNOWLEDGE AND PRACTICES OF PATIENTS WITH DIABETES TOWARD CARE OF FOOT?.

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Abstract

Diabetes mellitus is a leading cause of morbidity and leads to microvascular (retinopathy, nephropathy, and neuropathy) and macro-vascular (coronary artery, cerebrovascular, and peripheral vascular disease) complications. Therefore, there is an urgent need to find innovative and effective solutions to help people successfully manage their diabetes. This study was conducted to determine the knowledge and practice of patient with diabetes toward the care of their foot. The study includes 93 males and 104 females suffering from diabetes. The findings of the current study highlighted the insufficient level of knowledge and poor practice. There was a significant association between male gender and sound knowledge level and proper practice. There is an urgent need to increase the level of knowledge and practice about foot care.

Introduction:-

Diabetes mellitus is a disease with many faces and define as "a syndrome of chronic hyperglycemia due to relative insulin deficiency, resistance or both". (1,2) Almost 346 million people suffer from diabetes around the world. Al-Hariri MT, et al 2017 & Hasnain S1, Sheikh NH 2009 there are several complications linked to DM, where the most common one is foot ulceration, with incidence rate between 8-17%. Al-Hariri MT, et al 2017& George H ,2013

During1980s In UK, dialectologists started notice diabetic foot and in other European countries during 1990s. This group was known as "International Working Group on Diabetic Foot (IWGDF)". It is affiliated with International Diabetes Federation (IDF) and for the last ten years, it was very active . (Hasnain S1, Sheikh NH,2009)

The foot ulcer is defined as "any necrosis, gangrene, or full-thickness skin defect occurring distal to the ankle in a diabetic patient". Hariri MT, et al 2017 & Schaper N,2012 Several studies estimated that 2.5% of diabetic patients get a diabetic foot every year, and 15% of them get a diabetic foot during their life. Hariri MT, et al 2017 & Shojaiefard A et al., 2008 Where many studies and reports recorded that almost quarter (25%) of diabetes patients hospitalizations were due to foot ulceration, with higher mortality rate than DM patients without foot ulcer, Hariri MT, et al 2017 & Al-Maskari F et al., 2007 where (85%) of lower limb amputations in diabetes patients are due to foot ulcer, which has significant negative influence on the patient psychologically and physically, and reduces the quality of life of the patients , with significant economically and health burdens . Hariri MT, et al 2017& Otene CI et al., 2015.

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The main pathological factors involved in developing the foot ulcers in DM patients are neuropathy, mechanical stresses, and angiopathy, where diabetic peripheral neuropathy is defined as "a heterogeneous disorder that includes mononeuropathies, polyneuropathies, plexopathies, and radiculopathies".

Regarding the fact that diabetic neuropathy repeatedly causes foot ulcer, it is recommended to screen all patients with diabetes at least yearly. George H ,2013.

There are several reasons for bad outcomes of foot complications in developing countries which include insufficient level of awareness among patients, limited podiatry services, bad access to health care facilities, delay in seeking medical care, a poor referral system for specialist treatment, shortage of team approach concept for the management of the complicated foot, lack of quality assurance programs and training programs for health care providers. Otene CI et.,2015.

As a consequence of diabetes, the incidence of lower extremity amputation becomes the key predictor of the quality of foot care provided. One of the goals demonstrated by "The International Working Group on the Diabetic Foot" and accepted by "the International Diabetes Federation (IDF)" to decrease the rate of amputation around the world, is to tell people with diabetes of the preventive measures they can take to reduce foot complications. Otene CI et al., 2015 & Aljoudi AS., et al 2009.

In Saudi Arabia, the prevalence of diabetes is high and causes a main public health problem, where 13.5% of DM patients refer to the nephrology clinic with 7.7% of patients undergoing chronic hemodialysis. Alqurashi KA et al ., 2011, Al-Wakeel J et al., 2009& Qari F , 2005.

This study aimed to assess the level of knowledge and practice of foot care among diabetes patient in Jeddah, Saudi Arabia 2017.

Subject and Method:-

This cross sectional study was conduct via sending email and messages containing the questionnaire to patients with diabetes. During the period from January-April 2017. The contacts of patients were obtained from the consultants who revised the questionnaire. Structured questionnaire was used to collect the data from the participants. The questionnaire includes four main parts: sociodemographic data, medical characteristics, knowledge (12 items), and practice (11 items).

The questionnaire was revised by three consultants, two from surgery and one endocrinologist from medicine departments to enhance the content validity.

A Pilot study was conducted among 26 patients with diabetes to determine the face validity of the questionnaire.

Two questions were modified to facilitate having the correct response.

The internal consistency of knowledge part and practice part were checked by alpha cronbach , 0.81 and 0.75 respectively. The internal consistency of the whole questionnaire Alpha cronbach 0.78.

Data analysis was done by Statistical package for social science (SPSS) version 16. The data were collected and entered to the computer. Statistical analysis was done using Statistical Package of Social Science (SPSS) Version 16 (Chicago, USA), IL 60606-6307. The quantitative data was presented in the form of mean and standard deviation. The qualitative data were presented in the form of number and percentage. Chi-square was used as test of significance for qualitative data. Person correlation coefficient was used to study the correlation between variables. Significance was considered at p value less than 0.05.

Results:-

Table (1) showed demographic characters of the studied patients with diabetes. No significant difference were detected between male and female gender regarding age ,nationality, marital status, education ,income, family history of Diabetes and body mass index. The prevalence of Cigarette smoking and Sheisha smoking were higher significant among male gender than female gender.

Table 1:-demographic characters of the studied patients with diabetes

	Male N=93	**Female N= 104**	**Test of sig**	**Total N=197**
Age Mean ± SD	58.12± 8.57	57.51± 6.57	T=1.51 P=0.65	57.34± 6.57
Nationality Saudi Non-saudi	69/24	64/40	Chi-square=3.58 P=0.058	133/64
Marital status Single Married Divorced widow	28 (30.1) 57 (61.3) 9(9.7) 7(7.5)	14 (13.5) 70 (67.3) 15(14.4) 5(4.8)	Chi-square=3.62 P=0.306	28 (30.1) 57 (61.3) 9(9.7) 7(7.5)
Education Illiterate Primary Secondary High school and university	24 (25.8) 24 (25.8) 23(24.7) 22(23.7)	36 (43.6) 24 (23.1) 24(23.1) 20(19.2)	Chi-square=1.9 P=0.059	60 (30.5) 48 (24.4) 47(23.9) 42(21.3)
Income **Less 5000** **5000-10000** **10000-15000** **15000-20000**	35 (37.6) 24 (25.8) 20(21.5) 14(15.1)	28 (26.9) 32 (30.8) 28(26.9) 16(15.4)	Chi-square=2.78 P=0.42	63 (32) 56 (28.4) 48(24.4) 30(15.2)
Family history of DM	25 (26.9)	24 (23.1.9)	Chi-square=1.78 P=0.44	49 (25.2)
Body mass index (kg/htm^2	30.01± 4.12	31.51± 3.57	T=0.96 P=0.79	30.61± 3.9
Cigarette smoking	15 (16.1)	4 (3.8)	Chi-square=8.78 P<0.001	19 (9.6)
Sheisha smoking	19 (20.4)	4 (3.8)	Chi-square=13.9 P<0.001	23 (11.7)

Table (2) showed Medical characters of the studied groups. No significant difference were detected between male and female gender regarding duration of disease, type of treatment, adherence to treatment ,diabetic related complication checking blood glucose and regular exercise .

Table 2:-Medical characters of the studied groups

	Male N=93	**Female N= 104**	**Test of sig**	**Total N=197**
Duration of diabetes Mean ± SD	8.09± 3.75	8.20± 3.81	T= .95 P=0.84	8.15± 3.75
Treatment Insulin Oral hypoglycemic drugs Insulin & oral hypoglycemic drugs	28 (30.1) 53 (57) 12 (12.9)	28 (26.9) 68 (65.4) 8 (7.7)	Chi-square=2.58 P=0.458	56 (28.4) 121 (61.4) 20 (10.2)
Regular treatment Regular	70 (75.2)			

Not regular	23 (24.8)	85 (81.5) 19 (18.3)	Chi-square=0.79 P=0.61	155 (78.6) 42 (21.4)
Diabetic related complication Yes	24(25.8)	4(3.8)	Chi-square=10.41 P=0.001	28(14.2)
Checking blood glucose	64 (68.8)	76 (73.1)	Chi-square=0 .43 P=0.53	57 (28.7)
Regular exercise	29(31.2)	28(26.9)	Chi-square=0 .43 P=0.53	57 (28.7)

Table (3) showed Correct knowledge of the studied group regarding diabetic foot. Male gender had higher significant the studied patient with diabetes had low level of knowledge about causes, prevention and risk factor of diabetic foot. Only 54% of the studied group knew about the value of balanced diet in prevention of diabetic foot. Male gender had higher significant knowledge than female gender regarding continues care for diabetic foot, risk factors (smoking , and lack of exercise.

Table 3:-Correct knowledge of the studied group regarding diabetic foot.

	Male N=93	**Female N= 104**	**Test of sig**	**Total N=197**
1-Not taking medicines regularly predisposes to complications	34 (36.5)	32 (30.8)	Chi-square=0.73 P=0.78	66 (33.5)
2-Continuous care a must for a diabetic foot because it may get small painless injuries	30 (32.3)	48 (46.2)	Chi-square=3.96 P=0.032*	78 (39.6)
3-Diabetic wound care is a must because infections do not heal quickly	46 (49.5)	64 (61.5)	Chi-square=2.9 P=0.059	110 (55.8)
5-Smoking causes blockage of the arteries which reduces blood flow to the foot	46 (49.5)	36 (34.6)	Chi-square=4.45 P=0.025*	82 (41.6)
6-Diabetic patient must follow a balanced diet	54 (58.1)	52 (50)	Chi-square=1.62 P=0.161	106 (53.8)
7-Diabetic patient must exercise	58 (62.4)	44 (42.3)	Chi-square=7.91 P=0.007*	102 (51.8)
8-Diabetic patient should check his foot	30 (32.3)	28 (26.9)	Chi-square=0.67 P=0.25	58 (29.4)
9-Does hyperglycaemia contribute to diabetic foot problems?	32 (34.4)	40 (38.5)	Chi-square=0.34 P=0.65	72 (36.5)
10-Does ischaemia contribute to diabetic foot problems?	30 (32.3)	32 (13.5)	Chi-square=0.05 P=0.87	62 (31.5)
11-Does atherosclerosis contribute to diabetic foot problems?	28 (30.1)	14 (13.5)	Chi-square=3.62 P=0.306	28 (30.1)
12 Does infection contribute to diabetic foot			Chi-square=0.34	

problems?	32 (34.4)	40 (38.5)	P=0.65	72 (36.5)

Table (4) showed Practices of the studied group regarding diabetic foot. The prevalence of healthy practices among was low among the studied patients with diabetes but,. The healthy practices were significant among male gender than female gender regarding washing feet by warm water, checking the inner part of shoes, cutting nails by sharp objectives, and drying the feet after washing.

Table 4:-Practices of the studied group regarding diabetic foot.

	Male N=93	**Female N= 104**	**Test of sig**	**Total N=197**
1-I inspect my foot regularly	28 (30.1)	20 (19.2)	Chi-square=3.15 P=0.054	48 (24.4)
2-I wash my foot with warm water	42 (45.2)	23 (22.1)	Chi-square=11.62 P=0.001*	65 (33)
3- I cut my nails straight across and not too short	34 (36.6)	10 (9.6)	Chi-square=20.62 P=0.001*	44 (22.3)
4- I repeat measured the size of my foot the last time I bought shoes	28 (30.1)	4 (3.8)	Chi-square=24.62 P=0.001*	32 (16.2)
6-I check the inner part of my shoe constantly	28 (30.1)	16 (15.4)	Chi-square=6.13 P=0.013*	44 (22.3)
7- I dried my feet after washing	35 (37.6)	16 (15.4)	Chi-square=12.62 P=0.013*	51 (25.9)
8- I wear comfortable coat shoes	43 (46.2)	51 (49)	Chi-square=0.15 P=0.77	94 (47.7)
9-I walk barefoot frequently [a]	67 (72)	79 (76)	Chi-square=0.39 P=0.77	146 (74.1)
10-I clean my nails with sharp Objects [a]	19 (20.4)	16 (15.4)	Chi-square= 0.85 P=0.45	35 (17.8)
11-I wear tight rubber stockings [a]	24 (25.8)	19 (18.3)	Chi-square=1.62 P=0.134	43 (21.8)

Discussion:-

It is not an overemphasized that there is a great need for DM patients to pay special attention to take care of their feet, where this care helped in reducing the morbidity from foot problems in diabetics. There are many various problems related to the diabetic foot, such as ulceration, amputation, and Charcot neuropathy. Otene CI et.,2015 .

However, from all DM complications , those related to the foot are considered the most preventable, where poor knowledge and poor practice of foot care demonstrated as a main risk factor for foot ulcer.

More than half of the participant (52.8%) were female and fro group age above 50 with mean age score (57.34± 6.57). This studied group has similar gender and age characteristics to what report in Brazil study 2009, Rocha RM et.,2009 (12) while in Indian study male rate was higher than female with younger age group (40-49). Dinesh PV1 et., 2016 . Also male gender showed to have more diabetes complication than female with no significant association, this results consistent with previous studies. Rocha RM et.,2009 & Dinesh PV1 et., 2016

Regarding educational level , the results showed that more than half of the participants had low educational level (less than 7 years in school), , this consistent with Brazil study (41%), Rocha RM et.,2009 and Southern India (36.6%) , Gupta RKet., 2015 while in India study the rate of literacy was (9.5%) , where the low level of education could causing problem in reading, writing , accessing and gathering more information , and understanding complex disease mechanisms and treatments provided, which representing low level of knowledge , while good level of education increase the level of knowledge. Rocha RM et.,2009 & Dinesh PV1 et., 2016 .

Regarding level of knowledge , the results show that in the third quarters of the statements , only thirds of the participants chose the right answer, and only in three statements(25%) slightly more than half chose the right answer, indicting insufficient knowledge level. Similar results were found in Mexico study (47.5%), Bohorquez Robles R et., 2017 and Nigeria study (21.8%). Desalu OO1 et al., 2011.

The most right answers were (wound care, following a balanced diet, exercises benefits, smoking dangerous and continues care). Where in three knowledge statements , there was significant association between gender and knowledge level , where female has the higher level in the knowledge about continues care , while male has the higher level in the knowledge about smoking dangerous and exercises benefits. For the rest 9 statements, the rate of right answers were high among men in 5 of them than women, which consistent with other studies from developing countries, and could be explained by socio-cultural beliefs.

In Nigeria study , the main lake of knowledge was in "the effect of smoking in reducing blood flow to the foot; need for consultation when warning signs like redness/bleeding occurs between toes and the importance of checking of the footwear regularly and regular inspection of the feet" . Where the results showed no significant association between gender , age and knowledge level. Desalu OO1 et al., 2011.

Regarding practice level, the results show that in two statements, more than half of the participants chose the right answer, while for the rest nine statements (82%) less than third chose the right answer, indicting poor practice level. Similar results were found in Mexico study (44.0%), Bohorquez Robles R et., 2017 . and Nigeria study (49.4%). Desalu OO1 et al., 2011.

The most right answers were (never wearing tight rubber stockings, never clean nails with sharp Objects, washing foot with warm water, dried feet after washing and inspecting foot regularly). While the main wrong answer was (walk barefoot frequently). In five knowledge statements , there was significant association between gender and practice level , where male has the higher practice level of (washing foot with warm water, dried feet after washing, cutting nails straight , check the inner part of shoe and repeating measured the size of foot) than female.
In comparison to the two statements with high rate of right answer in the current study , the majority of participants in Nigeria study showed low level of practice , where 95% stated wearing tight rubber stockings and 61% clean nails with sharp Objects, indicating lower level of practice. Desalu OO1et al., 2011

In contrast, the authors in Brazil study reported that women were more care of their feet (washing, drying, moisturizing and massaging) than men, and they explained that women are usually more concerned about health and used health services. Natalia de Sá P,2014 .

Overall, even that the results of current study showed increasing in the level of knowledge and practice among diabetes patients comparing with similar studies conduct in developing countries. It also show a big gap between knowledge and practice , indicating the need for more education and training program to raise the level of knowledge ,as well as the practice.

Conclusion:-

The findings of the current study highlighted the insufficient level of knowledge and poor practice. The main knowledge statements were (wound care and following balanced diet). The main good practice were (never wearing tight rubber stockings and never clean nails with sharp Objects), while the main bad practice (walking barefoot frequently).There was a significant association between male gender and sound knowledge level and proper practice level. There is need to increase the level of knowledge and practice about foot care, where all newly diabetes cases, as well as known diabetics should be educated about diabetes and its preventable complications. Further research need to be conduct about the knowledge and practice level & the appropriate ways to deliver those information.

Recommendation:
Structured health education program should be design and delivered to newly diagnosed patients with diabetes. Sound Knowledge about causes, risk factors, prevention of diabetes complication especially, diabetic foot.

The practices of patients with diabetes toward care of their foot should be explored and corrected to the sound practices.

The health education program should consolidate messages that include proper practices are ideal ways to prevent morbidity and mortality to patients with diabetes.

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