

RESEARCH TITLE

ASSOCIATION OF SOCIO DEMOGRAPHIC DATA AND BEHAVIORAL FACTORS IN PATIENTS WITH DIABETIC FOOT ULCER PRESENTING TO ALDARGA DIABETIC CENTER, WADMEDANI, SUDAN 2020

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Abstract

OBJECTIVE: To evaluate association of socio demographic data and behavioral in patients with diabetic foot ulcers (DFUs).

DESIGN: This was longitudinal cross section, analytical, and clinical study. Questionnaires assessing socio demographic of the patients, a structured questionnaire was administered to all participants.

SETTING: Aldarga Diabetic Center, Wadmedani, Sudan 2020

PATIENTS: 400 patients with diabetic mellitus presenting to Aldarga diabetic in Wadmedani. Patients with ischemic diabetic foot and mixed ulcers were excluded from the study.

MAIN RESULTS: The only significant risk variable among socioeconomic factors is kinship ($\chi^2 = 112.96, df = 2, p \text{ value} < 0.004$). Occupation showed marginal deviation, n from the significant level of 5%, about association with socio demographic factors but regarding Behavioral factors, All behavioral factors tested were significant. Practice of sport is always a risk factor in biostatistics related diseases, in this study the test shows, ($\chi^2 = 53.31, df = 1, p \text{ value} < 0.034$). Following correct nutritional diet is not significant, ($\chi^2 = 0.002, df = 1, p \text{ value} < 0.987$). Diabetic monitoring with doctor is highly significant, ($\chi^2 = 15.3, df = 1, p \text{ value} < 0.000$). Regular wound cleaning and dressing is highly significant, ($\chi^2 = 15.6, df = 1, p \text{ value} < 0.001$).

CONCLUSION: The social demographic variables and Behavioral factors, play an important role in diabetic foot ulceration. Given that the neuropathic ulcers are more easily preventable, systematic monitoring of patients with neuropathy is important. Intervention should be multidisciplinary and take into account socio demographic factors, as well as the whether the patient has family or caregiver support.

Key Words: Diabetes mellitus; socio demographic variables; diabetic foot ulcer

Introduction

Diabetes mellitus is one of the leading causes of death in the US; common complications that result in death are myocardial infarction and end stage renal failure. [1]

Diabetes care should be patient-centered and comprehensive, including lifestyle modifications and assessment of psychosocial health. Consider social determinants of health and formulate a treatment plan together with the patient.

The goals of diabetes management include eliminating symptoms of hyperglycemia, reducing or eliminating complications, and enabling as healthy a lifestyle as possible. [2].

Type 2 diabetes mellitus (T2DM) is a chronic metabolic disorder affecting about 425 million people worldwide in 2017, and, according to the International Diabetes Federation (IDF) report, is expected to affect up to 629 million people by 2045[3].

Sub-Saharan Africa is currently enduring the heaviest global burden of diabetes[4].

Diabetic foot disease (DFD) is one of the diabetic complications associated with major morbidity, mortality, and reduced quality of life and is the most serious complication of diabetes mellitus[3,4].The incidence of DFD is still rising[5]. According to the international consensus on diabetic foot, a foot ulcer is defined as a full-thickness wound below the ankle in a diabetic patient, irrespective of duration[6].

Diabetic foot ulcer (DFU) is becoming more than an indicator of complication status, having an independent impact on lower-extremity amputation and mortality risk[7].

It is also one of the complications of diabetes that can result in economic, social and public health burden, especially in low-income communities because it usually affects economically productive age groups, 30–45 years[8].

. MATERIAL AND METHOD

An institutional longitudinal, cross-sectional design was used to conduct the study among patients presenting at Aldarga Diabetic Health Center in Wadmedani Town, Gezira State, Sudan between the periods September 2020 to December 2020. The center is located in the North of Wadmedani town 186 KM south of Khartoum, the capital of Sudan.

The study includes all diabetes mellitus patients who attend the diabetic follow-up clinic at Aldarga Diabetic Center in Wadmedani town.

Data collection: A structured data collection tool was developed after carrying out a literature review mainly adapted from the publications. Socio demographic variables: age, sex, family type, marital status, educational status, residence, and average monthly income.

Sample size and sampling design

A random sampling method was used to select the sample in which the population (Total diabetic patients in 2020 reporting to the diabetic follow-up clinic.) The simple random sampling equation for provisional sample size n^* was calculated using the

following formula:

$$n = (t^2 \times p \times q) / (d^2)$$

Where:-

n*: Required sampling size.

P: Anticipated population proportion taken as 50% because it gives the maximum possible sample size. If we take the estimated prevalence rate for Sudan of 0.15 as P, the sample size will be 195 but we preferred a larger sample.

t: Confidence level, taken as 95%.

d: Absolute precision required on either side of anticipated proportion taken as 5 %

Then the provisional sample was multiplied by a design effect of 2 to give the final sample n:-

$$n = (2^2 \times 50 \times 50) / (25) = 400$$

Data Analysis methods

Descriptive statistics was initially undertaken to analyze the composition of the sample. Data were coded and entered into a computer using two of the latest versions of prepared packages of statistical analysis namely Statistical Package for Social Sciences (SPSS) version 24.0/25.0 version for Windows. The programs was used in different stages of data processing to process the raw data obtained from the questionnaires.

◆ **Ethical Aspects:** Before initiating the field survey the objective of ethics in research was insured by obtaining ethical clearance from the Director of Health Affairs in Wad Medani locality of Gazira state. A supportive formal letter was written to Aldarga diabetic Center. Data collection was done after permissions were obtained from the center managers, and oral informed consent was obtained from the study participants to start data collection.

RESULTS

(1) Respondent's socioeconomic characteristics

Table (1) shows the frequency distribution and descriptive statistics of the participant's socioeconomic characteristics. The youngest patient in the sample was 30 years of age and the oldest was the oldest was 89 years.

The majority of respondents are married (69.2%), 6.8 % are single with abnormally untypical high proportion of widows and divorcees (18%). The majority has basic education (39.8%), 20.2% have secondary education and 12.2% in the category university and over and these tallies very well with occupational classification as 65.8% either unemployed (38%), housewives (13.5%) or having unspecified jobs (15%). The general picture that can be drawn from the respondent's socioeconomic status is that diabetic patients reporting to Aldarga center are of medium social class category.

Table (1): frequency distribution and descriptive statistics of major respondent's indicators

Variable	N	Percent	Central tendency	Standard error of the mean
Age				
30-34	15	3.8		
35-39	10	2.5		
40-44	31	7.8	Mean = 59.5	1.31
45-49	28	7.0	Median = 60	-
50-54	42	10.5	Mode = 58	-
55-59	61	15.3	Skewness = -.222	- 0.012
60-64	48	12.0		
65-69	57	14.3	Kurtosis = 0.555	0.243
70 and over	108	26.8		
Total	400	100		
Marital Status				
Single	27	6.8	Median=2.0	-
Married	277	69.3	Skewness= 0.976	0.122
Widow	72	18.0	Mode = 2.0	-
Divorced	24	6.0	Kurtosis= 0.132	0.233
Total	400			
Educational Level				
Illiterate	34	8.5		
Khalwa	77	19.3	Median=3.0	-
Basic	159	39.8	Skewness = 0.163	0.057
Secondary	81	20.3	Mode=3.0	-
University	42	10.5	Kurtosis = 0.232	0.223
Postgraduate	7	1.8		
Total	400	100		
Occupation				
Professional	4	1.0		
Business	60	15.0	Median=8.0	
Employee and uniform	38	9.6	Skewness = 0.163	0.234
Worker and farmer	35	8.8	Mode=9.0	-
Housewife	54	13.5	Kurtosis = 0.232	0.122
Unemployed and others	209	52.3		
Total	400			

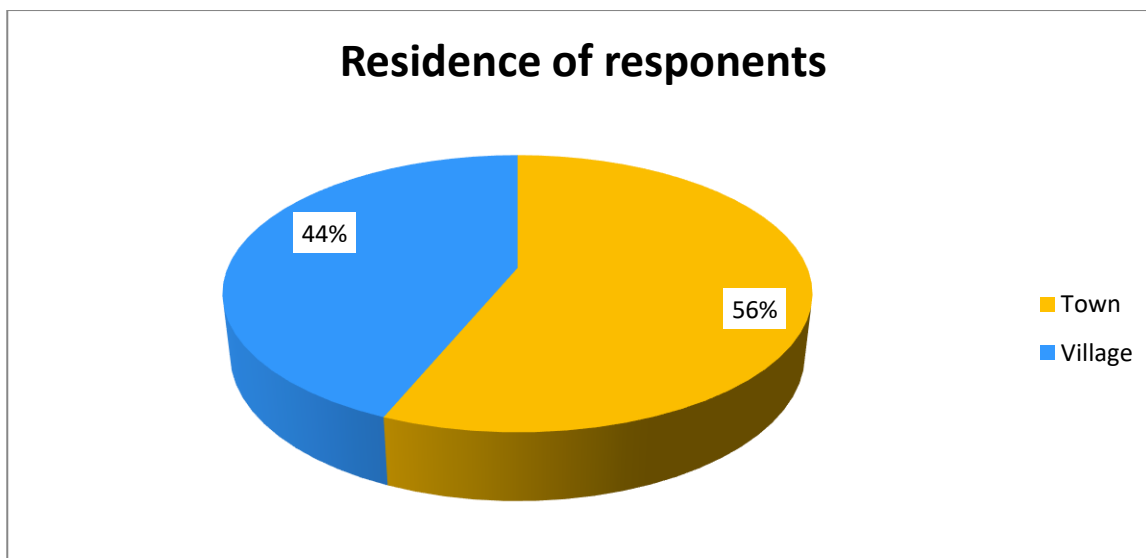
Source: Researchers own survey, 2020

Factors associated with Diabetic Foot Ulcer Using Fisher Exact Test.

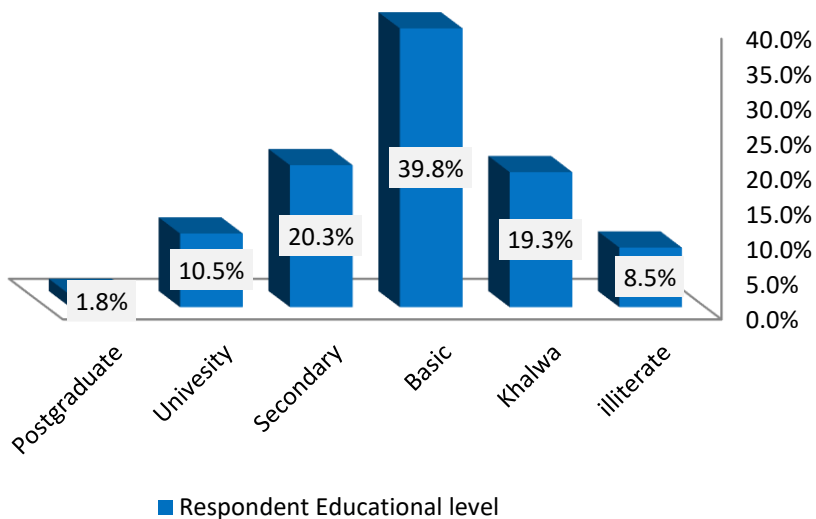
For the study of factors associated with DFU, this study used the chi-squared Fischer's exact tests.

Table (2) Factors associated with DFU

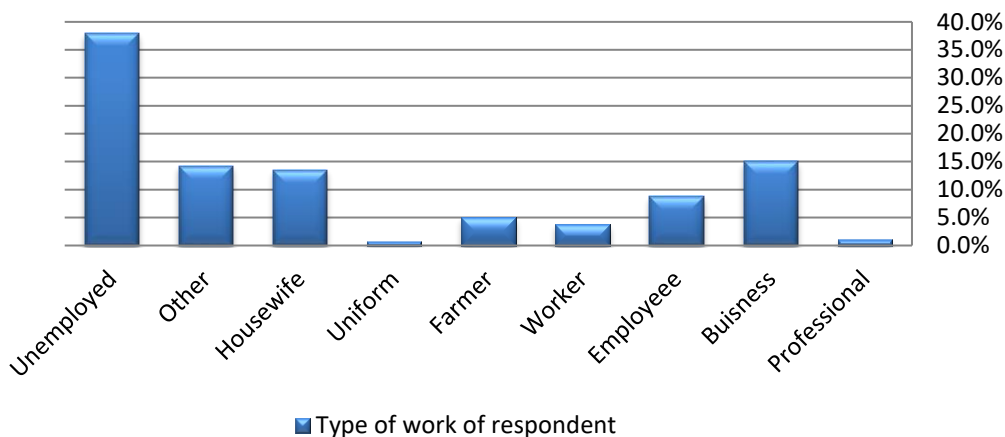
Variable (N = 400)	Chi-square (Fisher Exact Test)	DF	P- value
Association of DFU with socioeconomic variables			
Age	53.3	54	0.500
Sex	1.68	1	0.195
Residence	0.00	1	1.000
Family type	0.22	1	0.632
Monthly income level	0.45	3	0.930
Marital status	0.43	1	0.514
Educational level	7.49	1	0.186
Income	0.62	2	0.736
Occupation	45.78	8	0.051- (0.043)*
Diabetic in the family (kinship)	112.96	2	0.004**



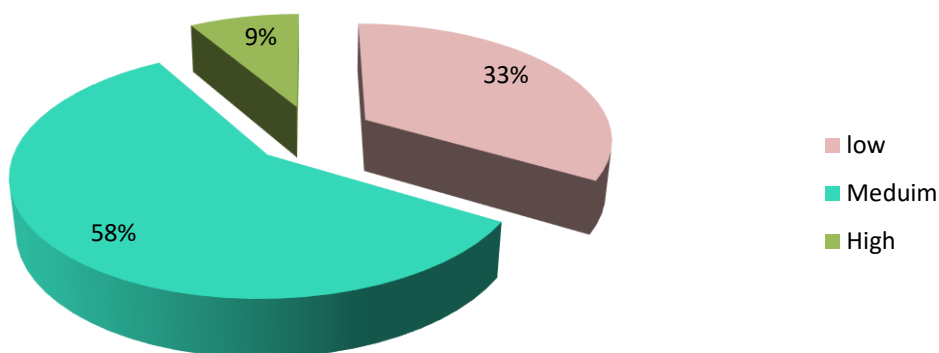
Figures (1)

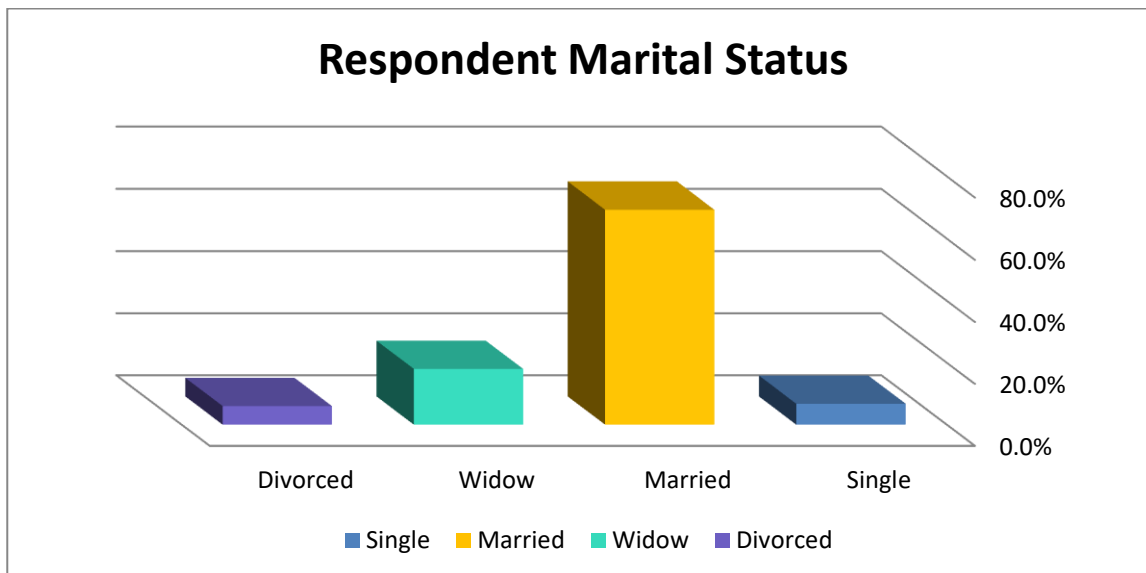


Type of work of respondent



Respondent Income level





(2)- Factors relating to respondents behavior

70.% reported that they practice sport and the most practiced sport is walking (67%), negligible percentages practice football and basketball 1.8% and 1.5% respectively. 29.5% do not practice sport at all. The majority of the respondents claimed that they follow correct nutritional practice. All the respondents claimed that they have their diabetic treatment under nutritional regime, mostly pills (58.5%), injection (29.5%) or pills + injection (12.0%) and 82.3% said that this is done under diabetic monitoring with their doctor. However, one bad sign is that only 59.5% of the diabetic patients in our sample wear diabetic shoes, In most African countries this percentage is more than 90%, For example in study in Ethiopia, this percentages is staggering 99.5%.[23].

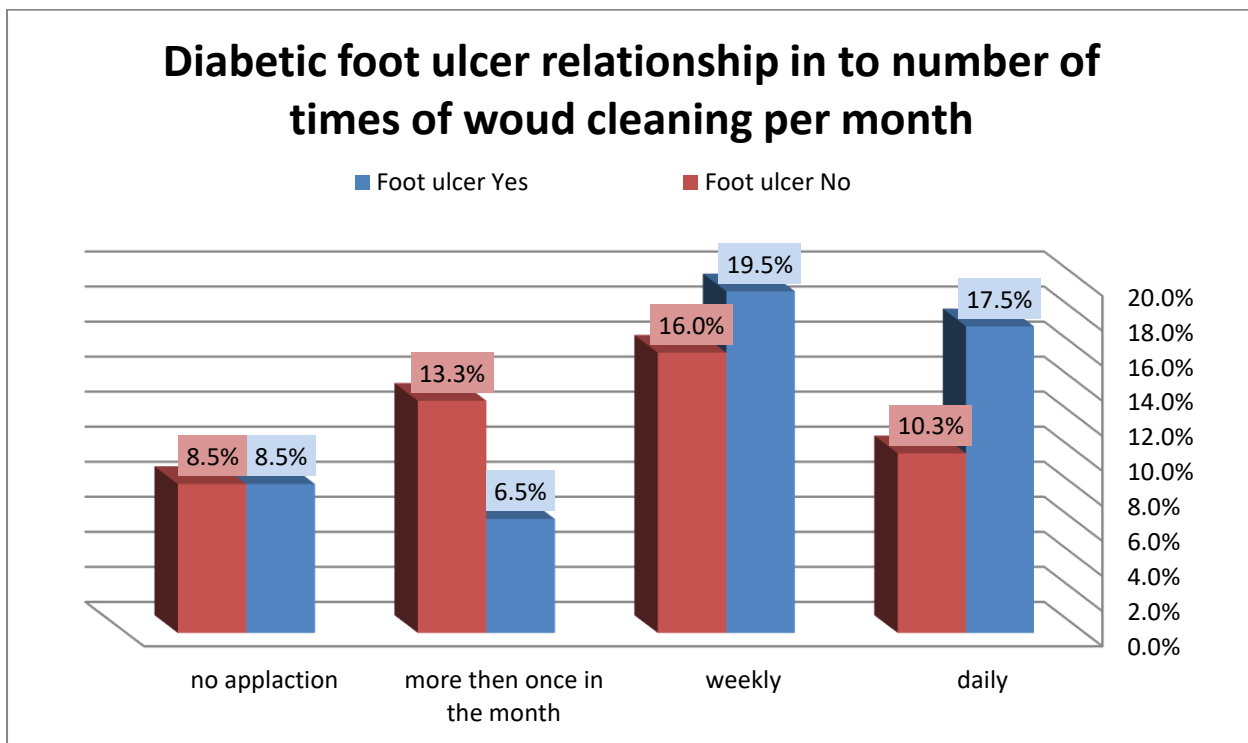
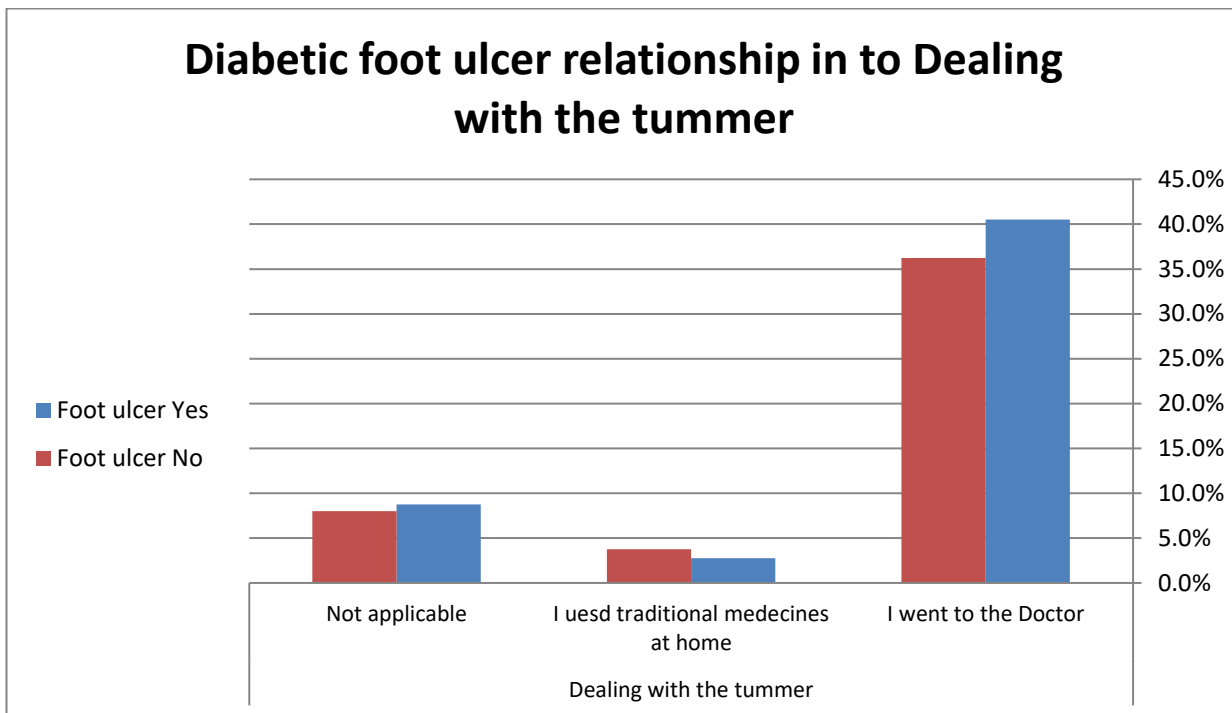
Table (2) Association of DFU with Behavioral variables

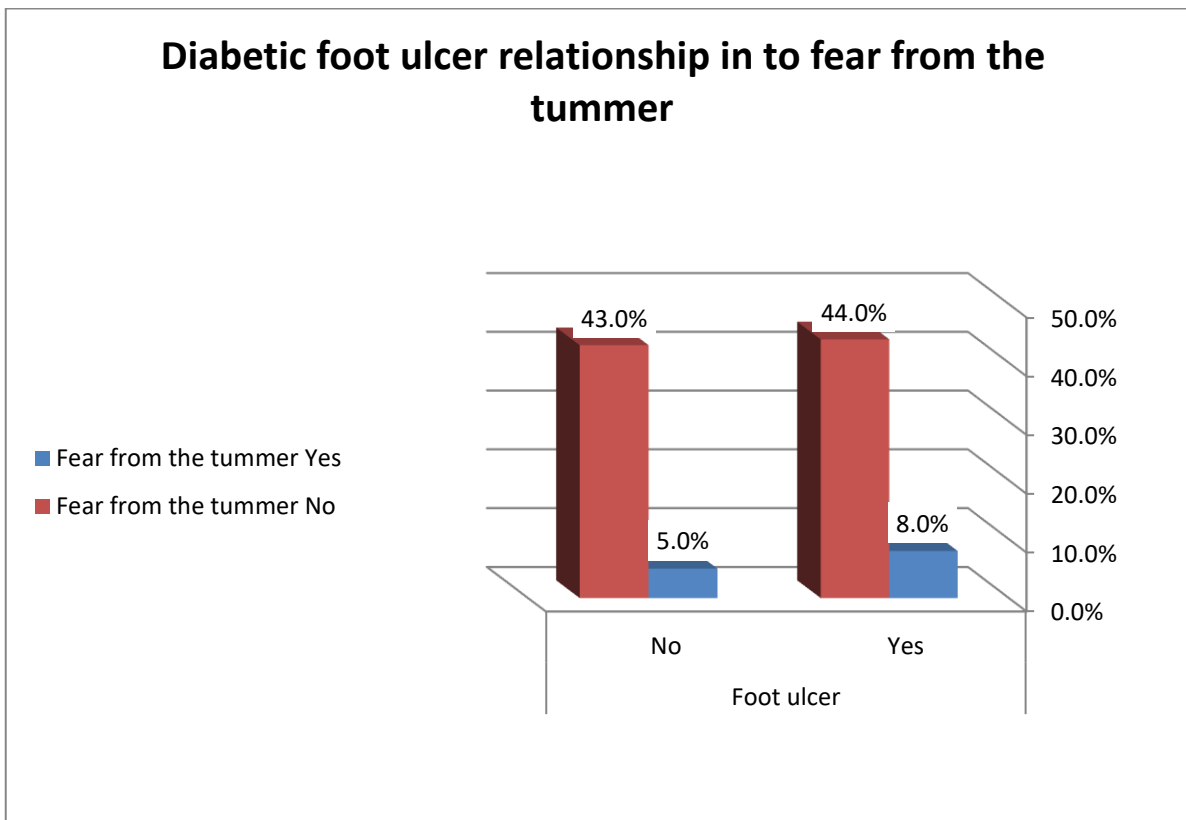
Association of DFU with Behavioral variables			
Practicing of sport	15.69	1	0.017*
Followed correct nutritional diet	0.002	1	0.978
Diabetic monitoring with Doctor	15.26	1	0.000**
Regular wound cleaning and dressing	17.57	1	0.001**

Source SPSS output based on: own survey , 2020

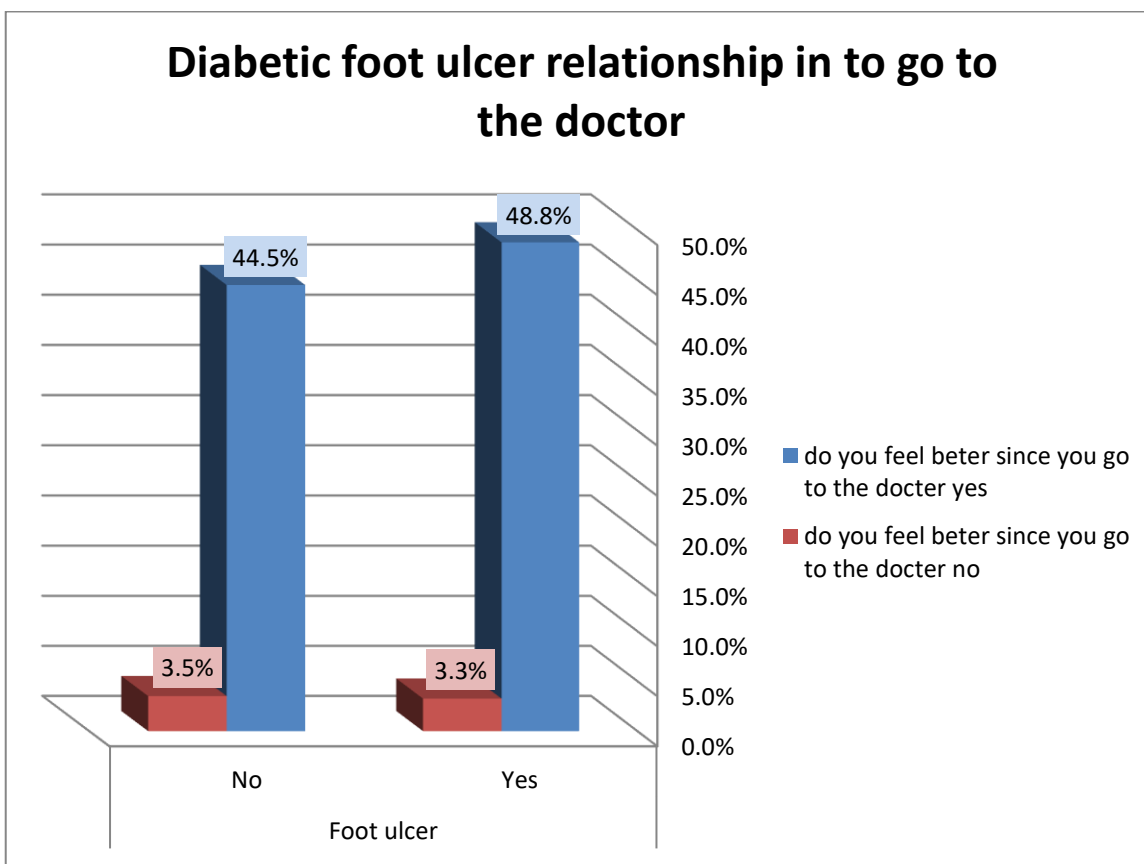
*The probability in brackets is the asymptotic likelihood ratio test at 5% level of significance. it was calculated because the fisher exact test is marginally out of range.

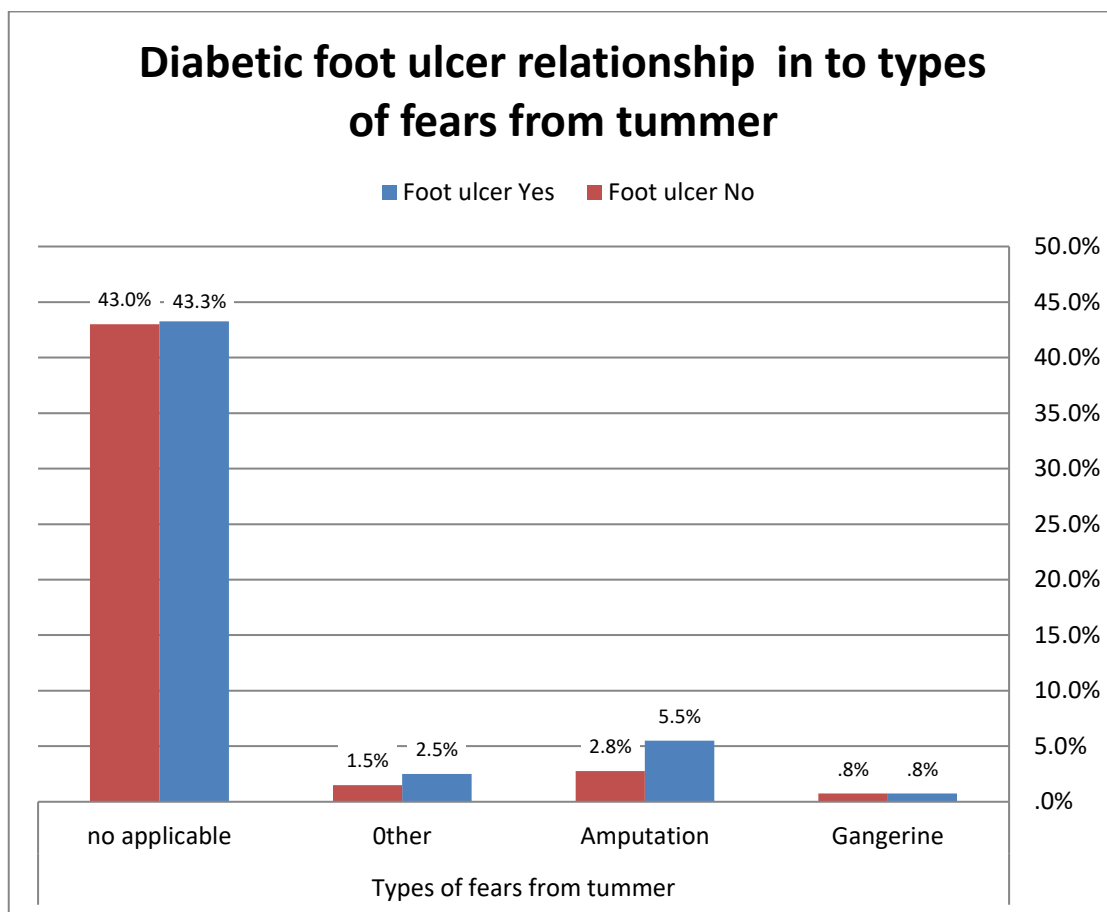
** Significant at 1% level of significant





All above figures showed behavior of participants how deal with tumors and cleaning of wound and this was had important effect in DFU





Discussion

This study as far as we know may be the first to estimate the association of socio demographic data and behavioral in patients with diabetic foot ulcers (DFU) in Gezira, state Sudan .

Majority of papers in DFU search association of prevalence and clinical factors association and rarely discuss socio demographic and behavioral factors ,and this to family doctors represent important area that can they work hard intervention so as to decrease develop of DFU and amputation .From this point of view the researcher search in above association . Table (2) shows Fisher Exact test for association of DFU with socioeconomic variables. The only significant risk variable among socioeconomic factors is kinship ($\chi^2 = 112.96, df = 2, p \text{ value} < 0.004$). This is a genetic effect of close relatives. It is highly significant at 1% level of significant. Occupation showed marginal deviation from the significant level of 5%, for this reason we examined the asymptotic significance using the likelihood ratio test and the result showed significance at 5% , ($\chi^2 = 45.8, df = 8, p \text{ value} < 0.034$). However, we may expect occupation to be risk factors as 43% of our sample members had their wounds been initiated by injury. This may be a risk of some manual jobs. Both bivariate and multivariate analyses have shown that a number of variables relating to socioeconomic profile of the respondents, their health behavioral attitudes , are significant risk factors in the development of DFU in patients with diabetic mellitus, particularly type II. However, three factors were distinguished for having higher risk, namely: kinship, Occupation,

Practice of sport, Diabetic monitoring with doctor is highly significant. And the above results not like results that found[older age, rural residence, poor self-care practice],had significant association with develop of DFU [9,10,11,12,13,14,15,16,17,18].

On other hand paper showed that “Significant proportion of patients with diabetes developed diabetic foot ulcer. Rural residence; occupation are factors associated with diabetic foot ulcer. In addition to regular diabetic care emphasis should be given on enhancing diabetic patient’s knowledge of self-practice and regular diabetic foot evaluation”[19],as this study in relation to occupation and Regular wound cleaning.

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