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Original Research Article

Effects of Health Education on Diabetic Foot Patients Knowledge: Pre- and Post-Study

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Abstract: *Background:* Foot ulceration in patients with diabetes is a costly and common problem and the leading cause of non-traumatic lower extremity amputation. With the rising global burden of diabetes in industrialized and developing nations, more attention is being dedicated to this issue. Although much effort has been put toward the study of treatment of ulcers, research on the prevention of this disease is still somewhat limited. (Lavery LA, 2012). *Aim:* of this study was to evaluate an intensive diabetes foot education program for veterans at high risk for foot ulcer. *Methods:* This is a quasi pre experimental study with pre and posttest implemented to evaluated the effect of the diabetic training program for foot care promotion and ulcer prevention. We invited 100 consecutive patients with diabetes from a Department of Veterans Affairs Medical Center clinic who were insensate to the Semmes-Weinstein 5.07 monofilament to participate in a foot care education program. Two sessions were conducted by a nurse diabetes educator 3 months apart. Multiple educational approaches were used to teach patients foot self-examination, foot washing, proper footwear, and encouragement in enlisting proper physician foot care. Knowledgeand satisfaction with care was measured before and after each visit. *Results*: The 34 patients who attended both education sessions improved their foot care knowledge over the course of the program. After the second session, the mean improvement over baseline was 14%. These patients also reported improved satisfaction with foot care; mean improvement was 33%. *Conclusions:* An intensive education program improved the foot care knowledge and behavior of high-risk patients and reduces foot ulceration as well as callus formation and fungal infection especially in high-risk patients. The study recommended continuous educational program for both diabetic patient and health provider should by applied.

Keywords: Health Education, Diabetic Foot and Patients knowledgeIntroduction.

INTRODUCTION

More than 120 million people in the world suffer of Diabetes Mellitus (DM) and too many of these subjects have diabetic foot ulcers when may eventually lead to an amputation.(Apelqvistj, Ragnson 1994). Ulceration of the foot is one of the major health problems for people with diabetes mellitus. It is estimated to affect 15% to 25% of people with diabetes at some time in their lives (Singh 2005). Foot ulceration can result in marked physical disability and reduction of quality of life (Nabuurs-Franssen 2005; Vileikyte2001), not to mention limb loss and even death (Robbins 2008). Diabetic foot ulcers precede 25% to 90% of all amputations (Global Lower Extremity Amputation Study Group 2000; Pecoraro1990). The risk of a lower extremity amputation in people with diabetes is therefore much higher than in people without diabetes (Canavan 2008; Icks 2009). Several factors are involved in the development of foot ulcers.

Similarly the risk for amputation in patients with diabetes is 15 times greater than for the non-diabetic population and the Majority of amputations are preceded by DFU. In addition to Increase morbidity and mortality, subjects with DFU have a Poorer quality of life in comparison to those without ulcers. (Sutton M. 2000).The annual incidence of DFU is 2.5% and it is estimated that 15% of all diabetics are affected by diabetic foot ulcers during their lifetime causing a considerable financial burden on health care providers. In the UK alone it has been estimated that 1.25 million hospital bed-days per *year a*t a cost of £220 million are required to treat diabetic foot problems. (Laing P, Cogley D, Klenerman L.1991). This figure does not include the whole cost, as there are almost

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seven times as many patients in the community as in the hospital .(Peacock I, Fletcher E, Jeffcoate WJ.1985). Similarly, in the USA, 15% of total admissions for people with diabetes during a two year period were related to foot problems which accounted for 23% of the total hospital days Direct hospital costs for the treatment of diabetic foot infectious exceed $200 million per year and that for amputation related to diabetes exceed $350 million annually. (Pecoraro RE 1998). The non-healing diabetic ulcer - a major cause for limb loss. In: Barbul A, Caldwell MD *et al.* (eds 1991).

Despite this, DFU is often neglected by the mainstream medical specialities. One of the main reasons for this is the absence of coherent management policy of this disorder as various specialists such as podiatrists, vascular surgeons, dialectologists, district nurses etc are involved in the management of DFU More recently there has been increasing recognition of the problems caused by this condition and multidisciplinary foot clinics have been introduced in various parts of the world. Care of foot ulcers can reduce the rate of amputation by as much as 50% (Edmonds ME, Blundell MP, Morris ME, *et al*. 1986).

With increasing recognition of the importance of this condition, the attention has now been focused on the prevention of this complication. In the UK, the National Service Framework of Diabetes has reiterated the importance of regular surveillance for the long-term complications of diabetes including that of diabetic foot problems and the key interventions.

DFU is a preventable condition if high risk individuals are identified by appropriate screening programmes and are given appropriate foot care education similarly if various chronic complications of diabetes such as neuropathy, peripheral vascular disease and foot deformities are prevented, it may be possible to prevent the development of DFU and Its consequences. There have been exciting developments in this field and various new studies and observations are detailed below (Borssen Bergenheim 1990).

Diabetic foot education programs generally include instruction on daily foot self-inspection, avoidance of trauma, such as walking barefoot, and encouragement for patients to contact their physician should any new abnormality appear. Interventions aimed at educating patients on foot care and self-monitoring have been studied, with mixed results (Lincoln NB, Radford KA, Game FL, 2008).

(A systematic review published in 2001 by Valk and c olleagues. (Valk GD, Kriegsman DMW, Assendelft WJJ.) revealed some evidence that a patient education program improves patient foot care and reported evidence supporting the effect of an patient education program on decreasing ulcer incidence and callous formation, particularly for high-risk patients (those with prior infection ulcer, or amputation) receiving intensive educational interventions. Other randomized, controlled trials did not reveal similar effect of education on decreasing ulceration incidence.

A recent randomized control trial by Lincoln and colleagues that evaluated individual educational sessions for patients with history of prior ulceration found improved compliance with recommended foot care behaviours but no significant difference in the incidence of recurrent ulceration in 12 months of follow -up between intervention and control groups (Lincoln NB, Radford KA, Game FL, *et al*. 2008). Patient education is often included in complex/ combined intervention strategies. This makes it difficult to ascertain what proportion of the reported benefits can be ascribed to the educational component of these interventions. Education programmes for the prevention of diabetic foot ulceration can be targeted at people with diabetes and / or the health care professionals managing their care. This review focuses on the education of people with diabetes. It is generally thought that all people with diabetes, especially those at high risk of foot ulceration, should learn the principles of self-examination of the feet and foot care (Boulton 1995; Edmonds 1996). Unfortunately, lack of awareness ,knowledge and skills by both patients and health care providers ,still results in insufficient prevention and management in too many patient. (Apelqvist 19)Ulceration of the foot is one of the major health problems for people with diabetes mellitus. It is estimated to affect 15% to 25% of people with diabetes at some time in their lives (Singh 2005).

Foot ulceration can result i n marked physical disability and reduction of quality of life (Nabuurs -Franssen 2005; Vileikyte2001), not to mention limb loss and even death (Robbins 2008). Diabetic foot ulcers precede 25% to 90% of all amputations (Global Lower Extremity Amputation Study Group 2000; Pecoraro1990).The risk of a lower extremity amputation in people with diabetes is therefore much higher than in people without diabetes (Canavan 2008; Icks 2009). Several factors are involved in the development of foot ulcers. Foot ulceration in patients with diabetes is a costly and common problem and the leading cause of non-traumatic lower extremity amputation. With the rising global burden of diabetes in industrialized and developing nations, more attention is being dedicated to this issue. Although much effort has been put toward the study of treatment of ulcers, research on the prevention of this disease is still somewhat limited. (Lavery LA, Wunderlich RP, Tredwell JL 2009g). During researchers work in Omdurman teaching

hospital observed that the most of patients withlower extremities amputation have diabetes, this amputation can be avoided if we were able toteach patients about foot care (Smeltzer & Bare 2004) With an exception of Jabir Abu Aliz as specialized center no health education is given to patients in proper way so it is necessary to concentrate on diabetes education.

METHODOLOGY

Research design

This is a quasi pre experimental study with pre & posttest implemented to evaluated the effect of the diabetic training programme for foot care promotion and ulcer prevention.

Study duration

This study was extended from July 2012 to July 2014.whole period of the study.

Study subjects

The population of this study consists of diabetes mellitus patients, who attended to Jabber Diabetic Centre (JADC) in Khartoum Statem.

Sampling technique and sample size

Sampling technique

The sampling procedure of this study was total coverage sampling for diabetic patients attended to (JADC) during data collection period from February 2013 to August 2013.

Sample size

Total coverage which include 100 diabetic patients

Inclusion and exclusion criteria

Inclusion criteria

All new diabetic patients attending (JADC),in period between February 2013 to August2013 .

Exclusion criteria

It excludes patients who already have foot ulcer or whose carers refuse to participate in the study

Study area/setting

The study was conducted in Jabber Abu Eliz Diabetic centre (JADC), it located in Khartoum; it was established in 1998 by the Khartoum State Ministry of Health as the first multidisciplinary specialized diabetic centre in Sudan. It caters for 40/000 registered diabetic patients, with a monthly turnover of 450 new patients per month and 200 outpatient per day .Jabber Abu Eliz Diabetic Centre encompasses six surgical clinics, five medical clinics ,and one clinic of ,dermatology ,dentistry, medical orthosis, ophsalmology, paediatrics and podiatry. Moreover, JADC provides services in health education .social and psychological support. It also provides research opportunities for post graduate doctors with more than eighty researches currently running at the centre. Also the JADC provides training for the staff in diabetic foot management in big hospitals at UK and Nether land so that it content good trained power man as well as more than 5 surgeons, 15podiatrists, 6 medicals and orthotists.

Procedure of data collection and Tools

Data tools: A structured and validated questionnaire (annex 2) was used for assessing diabetic foot knowledge and to evaluate presence of foot ulcer. Opend ended and closed ended questions were discussed by face to face interview technique, the questionaire include the following:

- Personal data (name, sex, age, address, phone, and marital status), socioeconomic data (Occupation education and crowding index), and time of onset of diabetes.
- questions about foot care, skin care, nail care and foot wear knowledge

Scoring and Statistical analysis

The data was analysed by using Statistical Package for Social Sciences (SPSS) version 20 for quantitative data to find out patients' knowledge.

Every favorable response was given a score of 1 or more and every unvavorable response was given a score of 0. Hence higher the corres, better was the knowledege abou diabetic foot care.Total score for foot care knowledge assessment was 100, Score less than 30 indicated that the subjects had poor knowledge. Scores between (40-70) indicate the subjects had average knowledge, and score above 80 indicate the subjects had good knowledge.

Study variables

Dependent variables

The main dependent variables in this study are diabetes complications such as foot ulcer, level of knowledge and foot care.

Independent variables

The main independent variable or explanatory variable is the training programme. It was measured as present or absent (binary variable). For those who received the training will be scored as present.

DATA COLLECTION PROCEDURE

Data was collected by the researcher and the assistance trained team by filling questionnaire to assess level of knowledge of diabetic patients for preventing diabetic foot ulcer.

Stages of study

The program should be carried out in 3 main stages:

- Analysis of the current situation
- Immplementation of the prevention program
- Evaluation of results.

Stage 1(Pre stage)

The stage to evaluate the patient for foot care knowledge and, skin care, nail care and foot wear before intervention by fill fulling the questionaire after that inform each patients indiviually by the schedual and time table of education program which is writen in papers and distributed for all patient furthe more patients were distributed for two groups each group contents 50 patients with consider of age, education, and culture diferences. (see annex2).

Stage 2 (Implementation stage)

Its implementation stage of education program (annex 2) which includes 2 sessions for both groups which take 45 minutes each week for 2 month, patient's education done by researcher; the objective of education is to modify the self-care behavior of the patient and to enhance compliance with foot care advice. The patient has recognized potential foot problems and then takes the appropriate action (seeking professional help).

Purpose of education

Improving knowledge regarding foot problems**,** reducing the incidence of ulceration and amputation**,** preventing diabetic foot complications and assisting in early detection of problems**,** and redefining the role of the patient as partner in medical decision making.

Description of education

Education was simple, relevant, consistent and repeated. Also used Instructional materials, such as handouts, booklets, and videotapes, to supplement the instruction and provide resources.

Content of patient education included

1. Prevention of foot skin breakdown by identifying common causes. 2-Proper foot and nail care.
2. Buying shoes and socks, and breaking in shoes.
3. Care of orthotic devices/shoes and when to replace. 5-When to seek medical care.
4. Wound care.
5. Relapse prevention.

Stage 3(Post stage)

Evaluation stage to see the outcome of intervention program. Posttest done after 3 weeks of intervention

Ethical consideration

- An official letter was taken from Alribat University to approach the director Of JADC for permission to conduct the study.
- Prior to the study the aim of the study was fully explained and clarified by the researcher for all diabetic patients

under study.

- The process of intervention was also clearly explained to the subjects and their autonomy to participate in the study.
- Study participants provided verbal consents prior to participation in the study.
- The research is respecting the rights of participants, treat data with confidentiality, and no harms for the subjects by interventions.

RESULTS

Distribution of results

Table-1: Distribution Age range

Valid	Frequency	percent
30-50	24	24.0
50-70	56	56.0
More than 70	20	20.0
Total	100	100.0

Table (1) shows that majority of age range (50-70) 56% and the minority of age range is more than 70, (20%)

Table-2: Distribution of Education level

Valid	Frequency	percent
Primary	26	26.0
Secondary	50	50.0
Universal	16	16.0
Literacy	8	08.0
Total	100	100.0

Table-3: Shows that majority of participant in secondary education level (50%)

Table-3: Distribution of religion, sex and marital status

Valid	Frequency	percent
Muslim	100	100%
Male	58	58%
Married	80	80%
Single	16	16%
Divorce	4	4%

Table (3) shows all participants are muslims (100%), 58% of participants are male, 80% of them married and just 4% of them divorced.

Table-4: Distribution Assessment of the patient basic knowledge about foot wear for preventing diabetic foot ulcer (n=100- 2013)

Variable: Do you know that you should	pre Intervention Fre. (%)n=100	post Intervention Fre. (%)n=100	p. value	
Buy well-Fitting shoes.			0.210	Insignificant
	YES: 66(66%)	9 8(98%)		
	NO: 34(34%)	2(2%)		
Look for foot-shaped shoe			0.003	Significant
	YES: 88(88%)	96(96%)		
	NO 12(12%)	4(4%)		
Avoid slip-on or court shoes.			0.140	Insignificant
	YES: 28(28%)	92(92%)		
	NO: 72(72%)	8 (8%)		
Shoe heels should be under 5 cm high			0.049	Significant
	YES: 76(76%)	96(96%)		
	NO: 24(24%)	4 (4%)		
Do not wear slippers all day along			0.000	Significant
	YES: 94(94%)	98(98%)		
	NO: 6(6%)	2 (2%)		

Yes: means I know

NO: means I Don't know

Table (4) reveals that before implementation programm 66% of participants know that they should buy well-fitting shoes, rise to 98% after immplementation programm.

88% of participants know that they should look for foot shape shoes pre intervention and 96% post intervention; just 28% of participants avoid slip or court shoes before intervention and 92% after intervention

Table-5: Distribution assessment of the patient knowledge about foot care for preventing diabetic foot care (n=50)

Variable: Do you know that you should	**pree Intervention Fre.(%) n=100**	**post Intervention Fre.(%) n=100**	**p. value**	**Comment**
Don't walk bare footed	Yes: 100 (100%) N0: 0(0%)	100(100%) 0(0%)	0.035	Significant
Never try to remove corn or callus by your self. corn cures very dangerous if you have diabetes	YES: 78(78%) NO: 22(22%)	96(96%) 4(4%)	0.033	Significant
Never toast your toes in front of the fire	YES: 13(26%) NO: 37(74%)	94(94%) 6(6%)	0.087	Insignificant
Prevent dryness in your feet by using a moisture- restoring cream	YES: 68(68%) NO: 32(32%)	86(86%) 14(14%)	0.318	Insignificant
Visit a podiatrist regularly if you have callus	YES: 3(6%) NO: 47(94)	88(88%) 12(12%)	0.088	Insignificant
Position your bed away from wall radiators and hot- water pipes	YES: 8(8%) NO: 92(92%)	86(86%) 14(14%)	0.136	Insignificant

Table (5) reveals that all participants know that they should not walk bare footed pre and post intervention.

As well as just 6% of patient visit podiatrist regularly if have calls before intervention and after intervention about88%.also show that 68% using cream to prevent dryness in their feet before intervention and post is about 86%.

Table-6: Distribution of assessment of the patient nail care knowledge for prevention diabetic foot ulcer (n=100)

questions	**pree Intervention(yes Fre.(%)n=100**	**post Intervention Fre.(%)n=100**	**p. value**	**comment**
Do you know that you should Cut your nails to the shape of your toe? YES NO	 50(50%) 50(50%)	 96(96%) 4(4%)	1.000	Insignificant
Do you know that you should Avoid cutting your nail too short? YES NO	 78(78%) 22(22%)	 98(98%) 2(2%)	0.024	Significant
You should not cut your nail if your vision is poor" Yes NO	 76(76%) 24(24%)	 88(88%) 12(12%)	0.386	Insignificant
You should not cut your nail if your nail are too thick" YES NO	 90(90%) 10(10%)	 96(96%) 4(4%)	0.001	Significant
You should not cut your nail if your feet is numb or circulation is poor YES NO	 33(66%) 17(34%)	 92(92%) 8(8%)	0.608	Insignificant
Never cutout			0.000	Significant
The corner of the nail or dig down the sides Yes NO	 96(96%) 4(4%)	 94 (94%) 6(6%)		

Table (6) shows 50% of participants know that should cut their nail at the shape of their feet before intervention and post intervention is about 96%.

78% of participants know that should avoid cutting the nail too short pre education but after intervention the rate exceed to 98% also 90% of them before intervention know that should never cut the nail if its too thick and 96% after intervention.

Table-7: Distribution assessment of the patient for ulceration and risk factor (n=100- 2013)

Varaiable	**pree Intervention** Fre.(%) n=100	**post Intervention** Fre.(%) n=100	**p. value**	**comment**
Do you have ulcer? Yes: No:	 14 (14%) 86(86%)	 4(4%) 96(96%)	0.4	The rate before intervention from JADC
Do you have a Fungal infection Yes No	 4 (4%) 96(96%)	 0(0%) 100(100%)	0.32	
Have a Callus formation: Yes NO	 6(6%) 94(94%)	 0 (100%) 100 (100%)	0.23	

Table (7) shows 14% of patient have diabetic foot ulcer and post education ulceration rate is 4%, also shows that 4% of patient have fungal infection and after education the fungal infection disappear (0%). Also 6% of patient have callus formation but after education disappear (0%):

Table-8: Distribution assessment of the patient skin and foot care for) preventing diabetic foot ulcer (n=50)

Varaiable	**pree Intervention Fre.(%) n=100**	**Post Intervention Fre.(%) n=100**	**p. value**	**comment**
Do you wash your feet daily YES NO	 100(100%) 0(0%)	 100(100%) 0(0%)	0.123	significant
Do you Wash between your toes: YES NO	 10 (10%) 90(90%)	 96(96%) 4(4%)	0.001	Significant
Using the moisture cream YES NO	 18(18%) 82(82%)	 94(94%) 6 (6%)	0.019	Significant
Dry area between toes and do not put cream at Yes No	 24(24%) 76(76%)	 88(88%) 12(12%)	0.118	Insignificant
Check the skin for cut, blister, or cracks every day YES NO	 26 (26%) 74(74%)	 98(98%) 2(2%)	0.056	Insignificant
Do not use any product unless it s recommended by your doctor Yes: NO	 18(18%) 82(82%)	 98(98%) 2(2%)	0.009	Significant
Did you have first aid box in you home Yes No	 4(4%) 96(96%)	 5 0(50%) 50 (50%)	1.000	Insignificant

Table (8) shows that all patients know that they should wash their feet daily (100%) pre and post intervention and 10% of patients know that they should wash between toes(before intervention) but after intervention there is 96%. 18% of patients know that they should use moisture cream (before intervention) and 94%(after intervention). 18% of patients know that they should not use any product unless it recommended by their doctor (pre intervention) and 82% of them know that they should not use any product without recommended (after intervention). 24% of participants know

that they should dry area between toes and do not put cream on it (before intervention) and 88% (after intervention). 98% of patient not has a first aid box at home and after intervention 50% of them have first aid box.

Table-9: Distribution assessment of participantn knowledge of foot wear, foot care, skin foot care and foot nail care. 2013

Total knowledge / *variable*		*Good*	*Average*	*poor*
Diabetic foot wear	*pre*	*0%*	*1%*	*99%*
	post	*80%*	*18%*	*2.0%*
Diabetic foot care	*pre*	*2%*	*3%*	*95%*
	post	*68. %*	*31%*	*1%*
Diabetic footskin care	*pre*	*2%*	*1%*	*97%*
	post	*44.0%*	*56%*	*0%*
Diabetic nail care	*pre*	*0%*	*2%*	*98%*
	post	*77.0%*	*22.0%*	*1.0%*

Table (9) reveals that in pre –test 99% of participants have poor knowledge of diabetic foot wear and posttest there are 80% of participants have good knowledge. In pretest 95% of clients have poor knowledge about diabetic foot care while in posttest there are 68% have good knowledge, as well as 97% of participants have poor knowledge about diabetic foot skin care which become 44% of them have good knowledge posttest.

Table-10: Relationship between Distribution of participant's age and their total knowledge about diabetic foot wear, 2013

Total knowledge / *Age*		*Good*	*Average*	*poor*
30-50	*pre*	*19%*	*31%*	*50%*
	post	*87.0%*	*6.0%*	*7%*
50-70	*pre*	*2%*	*6%*	*92%*
	post	*80%*	*9%*	*11.0%*
More than 70	*pre*	*1%*	*3%*	*96%*
	post	*79.0%*	*7.0%*	*14.0%*

Key: Tootal score (10 degree), -GOOD: 7-10, -AVERAGE: 5-7, -POOR: less than 5

Table-10: Relationship between Distribution of participant's education level and their total knowledge about diabetic foot wear 2013

Total knowledge / *Education level*		*Good*	*Average*	*poor*
Litracy (8)	pre	0%	1%	99%
	post	50%	43%	7.0%
Primary (26)	pre	3%	7	90%
	post	62. %	33%	5.0%
Secondary (50)	pre	1	10	89%
	post	40.0%	58%	2%
University (16)	pre	4	15	81
	post	98.0%	2.0%	0.0%

Table-11: Relationship between Distribution of participants Gender and their total knowledge about diabetic foot wear, 2013

Total knowledge / *Gender*		*Good*	*Average*	*poor*
Male (58)	*pre*	*1%*	*3%*	*96%*
	post	*85.0%*	*14.0%*	*1.0%*
Female (42)	*pre*	*0%*	*2%*	*98%*
	post	*51. %*	*47. %*	*2.0%*

Table-12: Relationship between Distribution of participants age and their total knowledge about diabetic footskin care, 2013

Total knowledge / *Age*		*Good*	*Average*	*poor*
30-50	*pre*	*1%*	*3%*	*96%*
		30.0%	*680%*	*2%*
50-70	*pre*	*21%*	*75%*	*4%*
	post	*9%*	*83%*	*8.0%*
More than 70	*pre*	*0%*	*3%*	*97%*
	post	*15.0%*	*79.0%*	*6.0%*

Table-13: Relationship between Distribution of participant's education level and their total knowledge about diabetic foot skin care 2013

Total knowledge / *Education level*		*Good*	*Average*	*poor*
Litracy (8)	pre	1%	2%	98%
	post	30%	67%	3.0%
Primary (26)	pre	0%	2	98%
	post	63. %	34%	3.0%
Secondary (50)	pre	0%	3%	97%
	post	43.0%	55%	2%
University (16)	pre	4%	4%	92%
	post	97.0%	3.0%	0.0%

Table-14: Relationship between Distribution of participants Gender and their total knowledge about diabetic footskin care, 2013

Total knowledge / *Gender*		*Good*	*Average*	*poor*
Male (58)	pre	1%	4%	95%
	post	74.0%	25.0%	1.0%
Female (42)	pre	0%	3%	97%
	post	82. %	15. %	3.0%

Table-15: Relationship between Distribution of participants Gender and their total knowledge about diabetic foot nails care, 2013

Total knowledge / *Gender*		*Good*	*Average*	*poor*
Male (58)	pre	0%	1%	99%
	post	77.0%	22.0%	1.0%
Female (42)	pre	0%	2%	98%
	post	83. %	13. %	4.0%

Table-16: Relationship between Distribution of participant's education level and their total knowledge about diabetic foot nail care 2013

Total knowledge		*Good*	*Average*	*poor*
Education level				
Litracy (8)	pre	0%	0%	100%
	post	46%	53%	1.0%
Primary (42)	pre	0%	2%	98%
	post	63. %	34%	3.0%
Secondary (50)	pre	1%	2%	97%
	post	72.0%	28%	0%
University (16)	pre	3%	7%	90%
	post	*97.0%*	*3.0%*	*0.0%*

Table-17: Relationship between Distribution of participant's age and their total knowledge about diabetic foot care, 2013

Total knowledge / Age		Good	Average	poor
30-50	pre	1%	2%	97%
	post	30.0%	680%	2%
50-70	pre	0%	1%	99%
	post	20%	82%	8.0%
More than 70	pre	0%	1%	99%
	post	15.0%	75.0%	10.0%

DISCUSSION

Male and female composition of participants was (58.%, 42.%) respectively. 1 - regarding diabetic foot wear as shown as in table (4) 78% of patients un aware about buying well-fitting shoe before intervention of health education program but after intervention 98% aware about that, The result statistically significant with p. value (0002). 72% of participants un aware about avoiding slip on or court shoes before intervention and 92%% after intervention aware about that, the result statistically significant with p. value (0.140) also76% of participants un aware about that shoes heel should be under 5 cm high before intervension comparing withwith 8% after intervention.The result statistically is significant p.value(0.049) Barefoot walking was surprisingly found much higher (100%) in our study, compared with 62%, 38%, 18% and 10% in Iranian, Nigerian, Saudi and Indian multi centric studies respectively. (Mohran 2004). The study showed that patients with low educational status had poor awareness regarding diabetes foot wear has also been found in earlier studies done in Iran and Pakistan. Baradaran HR (20007) also association between low educational status as well as low diabetes awareness level was found with poor practice of diabetic foot care, similar to another Pakistan study. (T Baradaran HR 2007) this suggests that education determines knowledge, awareness as well as practice of diabetic patients.

2 - About diabetic foot care: 90% of patients were UN aware about that should never remove callus by them self (see table 5) but after intervension 96% aware that. The result statistically significant with p.value (0.033) 97% of participants were UN aware that they should visit podiatrist regularly if have a callus before intervention, and after intervension 98% aware about that. The result statistically significant with p. value (0.088). 92% of patients were UN aware that they should position the bed away from wall Radiator and hot water pipes, before intervention but after intervention 95%.aware about that this deficiency of knowledge may due to poor communication betweendoctor and patients also lack of counseling by doctors and nurses as result of busy clinic schedule, negligence or work overload.

All these results showed that the educational program effect positively on diabetic Foot care knowled these agree with many study done by soundary and Mohan (2004) in India which found that education raised awareness about the disease, decrease cost and delay complication. Also agree by the study done in 2001 by Valk which revealed some evidence that patients education program improve patients foot care.

Regarding relationship between participants and education level the study showed that participant of had high education level gained more knowledge than those of low education level table (11) this supported by the study done in Iran in 2009 by Baradaran H.R which found that patients with low educational level had poor knowledge about foot care?

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