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Impact of 'Community based Diabetic patient education' on glycaemic status, life style and self care practices among type 2 diabetes patients in an urban slum of Mumbai, India

Gujrathi Amit *, Dhakne Supriya, Almale Balaji , Mahale Mahesh ,Vankudre Ashok and Gosavi Shriram
Department of Community Medicine, MVP's Dr Vasantrao Pawar Medical College, Hospital & Research Centre, Maharashtra University of health science, Nasik, India
*Corresponding author: Gujrathi Amit

Abstract

Demographic transition combined with urbanization and industrialization has resulted in drastic changes in lifestyles of all people but its harmful impact is more in developing countries because of their rapid pace of growth in last few decades. According to the recent World Health Organization report, India has around 32 million diabetic patients and this number is projected to increase to 79.4 million by the year 2030. Our Aim of the study was to assess the impact of community based DPE on glycaemic control, life style and self care practices among type 2 diabetic patients. This community based interventional study done among 272 type 2 diabetic patients who were selected from slum area. All patients were given Community diabetic patient education (DPE) over a period of one year. Following DPE the life style parameters and self care practices have improved which is statistically significant (p value <0.05). Both fasting and postprandial blood sugar level, blood pressure & BMI had been significantly improved (p value < 0.001).

Key words: type 2 diabetes, Community based Diabetic patient education (DPE), Life style and self care practices.

Introduction

Globally demographic transition combined with urbanization and industrialization has resulted in drastic changes in lifestyles of all people but its harmful impact is more seen in developing countries because of their rapid pace of growth in last few decades[1]. Chronic non communicable diseases are assuming increasing importance among the adult population in both developed and developing countries. Diabetes type II is leading cause of death among the all non communicable disease. [2] According to the recent World Health Organization report (WHO), India has around 32 million diabetic patients and this number is projected to increase to 79.4 million by the year 2030. [1]

Community-based Diabetic patient education (DPE) has several advantages over traditional education. First and probably most important is that Community DPE based on patient-perceived problems. Secondly, program content of Community DPE emphasizes on the teaching of skills such as problem solving and decision making. With such type of education people with diabetes will acquire minimum necessary skills and helps to gain the confidence to manage their disease on a daily basis. Thirdly, because such education takes place in community settings, which are not only more convenient, but also familiar to the target population. The scheduling of such education program is also based on patient rather than professional convenience.[3]

Many western studies have suggested the incorporation of an active diabetic educational programme in the successful management of diabetes. Such patient centric community DPE based on the person's intellect, motivation, and physical ability, social and personal resources results in empowerment of diabetic patients with minimum acquired skills for maintenance of the glycaemic control and helps to adopt healthy life style and self care practices.[4] Moreover, maintaining the blood sugar level in diabetic patient is utmost important as chances of developing complication is

depend on how patient is able to maintain the blood sugar level Good dlycaemic control is achived with proper dietary and life style modification.[5]

The present study is carried out keeping in view the above considerations. The main focus of this study is how patient can maintain the blood sugar level within normal range by adopting the healthy life style and how patients take care of themselves by knowing the self care practices like feet care, regular blood sugar ,check up regular medical and eye check up, regular taking of prescribed medicines, maintain optimum weight by doing regular moderate physical exercise.

Aims & Objective

To study the impact of community based DPE (Diabetes patient education) on glycaemic status, self care practices and life style modification among type 2 diabetic patients.

Materials and Methods

The present study was carried out in the Shivaji nagar slum which is adopted field practice area for community medicine department of tertiary health care institute Mumbai. This study was done during period of October 2009 to December 2010. This adopted slum is provided preventive and curative health services by the Urban health centre(UHC) of the tertiary health care institute. In an UHC as a part of service, a diabetic clinic is scheduled thrice a week in an UHC (Monday, Wednesday & Friday). Also a diabetic register with all details of patients such as name, age, sex, home address etc. is maintained in the UHC. The participants for this study were identified from diabetic register which had around 3000 patients listed at the start of the study. By taking 10% of them (300 patients) with type 2 diabetes since last 5 years were selected randomly. Home visits was done in all 300 patients and their detailed history regarding diabetes, their life style and self care practices were recorded in pretested Performa. Following are some life style and self care practices were carefully interviwed.

Life style modification factors:

1. Maintaining diabetic diet
2. Proper spacing between each meals.
3. Doing regular physical excercises for 30-45 mins
4. Restriction of added salts in regular diet

Self care practices

1. Taking medical prescription and medicine while moving out of station
2. Taking insulin injection by self
3. Maintaining blood sugar and blood pressure diary
4. Going for regular blood sugar and other laboratory examinations
5. Going for regular ophthalmological examination

The bed ridden patients, patients having serious co morbid conditions, and also patients who are not willing to participate in this study were excluded from the study. The present study got complete ethical clearance from central ethical committee of the teaching institute.

Follwing are some operational defintions

Diabetic Diet: Diabetic diet is the diet advised by doctor at the time of diagnosis.

Regular follow up and taking medicine: Those who are visiting to their doctor once in a month. Those who take medicines regularly as prescribed by the doctor

Added salts: salt intake more than 5 gm per day.patient taking food items such as papad, pickles ets.

Intervention (Community based DPE)

Registration of Patients at UHC: All the Participants were registered in diabetic clinic in urban health centre and followed up during October 2009 to December 2010. Each diabetic patient had given one individual code like 1/09 to 272/09.

Batch formation for DPE: Total 300 patients were grouped in to 8 batches. Each batch comprised of 30 to 35 patients. All the participants were motivated to attend Diabetic patient education (DPE) session on particular day (Wednesday of each week) preferably in morning hour from 9.30 to 11:00 am for about 90 minutes. Over a period of two months all 8 batches were covered. Such DPE were given in batches every 2 monthly, so over a period of 12 months each batch received at least three DPE sessions. Even though we tried to motivate all this patients for intervention but still 18 patients were either loss to follow-up or not received single DPE in study period. So for analysis purpose we got only 272 patients who were regularly attended DPE session. Community DPE were headed three experts i.e. epidemiologist, community social worker and dietician.

Community based Diabetic patient education sessions: Depending on the feasibility of all the patients of particular batch the timing was decided. Community DPE was given in local language. In 90 minutes of one education sessions following basic information were covered. As it was quite difficult to maintain the concentration for 90 minutes, session was divided into two 45 minute sessions. Following are the contents of community DPE. First 4 points were explained in 1st 45 minutes and next 4 points in next 45 minutes.

1. Basic information about Diabetes and its symptoms and complications
2. What type of food should be or should not be taken by diabetic patient.
3. Role of taking regular prescribed medicines and insulin injection.
4. Importance of regular follow-up for their physical examination and laboratory.
5. Importance of Diet control, proper spacing between meals.
6. Importance of changing the life style and self care practices..
7. Patients were also given information about hypoglycaemia and how to prevent it and what to do in hypoglycaemic episode.
8. Importance of regular moderate physical exercise.

Both fasting and postprandial blood sugars (FBS &PBS) were monitored once in a three months at the laboratory of an urban health centre while patient's blood pressure and weight measured once in month. The last follow up data were considered as post interventional data. For analysis purpose we compared the pre interventional data with post interventional data.

Also each patient was motivated to come for their eye check-up which was done by Ophthalmologist once in three month on particular day of week i.e. Thursday.

Statistical analysis: The collected data was numerically coded and entered in Microsoft Excel 2007 and then transferred to SPSS version 19.0. Added data was analyzed with appropriate test like Macnemar test, paired t-test to see the association between various parameters, with p value of less than 0.05 considered as significant.

Results

This community based interventional study involved 272 type 2 diabetic patients in which 180 (66.9%) were females and 90(33.1%) were males. It cane seen that in Table no. 1 the majority of patients 121 (44.49%) have diabetes since past two years and most of them 192(70.59%) were diagnosed during routine check up by their physicians. Most of them i.e. 115 (42.77%) did not have any typical symptoms of diabetes like polyuria, polydipsia, weight loss or infection in any part of body.

Continues community DPE was helpful for changing the life style and self care practices of type 2 diabetic patients. As seen from the table no 2 that all life style parameter were significantly improved after community DPE (p value <0.001). Similarly the self care practices also shows the improvements after DPE. Table no 3 shows that all self care practices such as taking prescription and medicines when they go out of station, taking insulin injection by self, carrying sugar pockets along with then to prevent hypoglycemia, going for regular laboratory and ophthalmological investigations, maintaining blood sugar & blood pressure diary were found out to be significant (p<0.001)

As seen in table no. 4 the mean fasting and postprandial blood sugar level in pre intervention was 135.6 mg% and 158.03 mg% respectively. After intervention the mean fasting and postprandial blood sugar level was 132.18 mg% and 153.45mg%.which is statistically significant (p value <0.0001).Similarly the mean systolic and diastolic blood pressure before intervention was 133.99 and 78.43mm of Hg respectively. After intervention the mean systolic and diastolic blood pressure was 126.94 and 77.18mm of Hg respectively which is statistically significant (p value of < 0.001). The mean BMI before pre intervention was 27.58 and after intervention was 27.02 which is statistically significant (p value <0.0001).

Discussion

This community based interventional study was done among 272 known type 2 diabetic patients in which180 (66.9%) were females and 90(33.1%) was males. Majority of the patients i.e.100 (36.76 %) belongs to age group between 40 to 45years. The KAP study done by Viral N. Shah et al on 238 Patients in saurastra region Gujarat [11] shows that 61.41% of the patients were in age group between 40 to 60 years.

Maximum no of patients i.e. 203 (74.63%) in this study were diagnosed in public sector hospitals i.e. government hospitals. In this study maximum number of patients i.e. 261 (95.06 %) were diagnosed as a diabetes since last 36 months and 11(4.04%) patients diagnosed since last 48 months. In this study majority of patients were diagnosed when they are in asymptomatic phase.

The absence of dramatic symptoms and the general paucity of diabetic symptoms perhaps the biggest barrier to early diagnosis of type 2 diabetes.[6]. India has highest prevalence of diabetes among all Asian countries and also it has been confirmed that the age at which the peak prevalence of diabetes reaches is 10 years earlier in Indians when compared with Chinese and Japanese patients. Hence diabetes screening has to be started early in India. This finding can be confirmed with the fact that in the Chennai urban epidemiological study[7] where the prevalence of diabetes among asymptomatic patients 9.1%. In this study, most of the patients' i.e.192 (70.59%) was diagnosed during their routine examination by their doctors. This may be due to most patient might be in asymptomatic phase and most of patients did not have specific symptoms of diabetes. Among the 157 patients (57.72%) who had some kind of symptoms or complications at the time of diagnosis, the general tiredness & body ache were found out in 61 (22.43%) patients who are followed by polyuria 38 (13.98%). While other symptoms like polyphasia, polydipsia and delayed wound healing found in other less than 8% of patients. The study done at Chandigarh by Sonia Puri H.M. et al [8] on 273 patients in an urban health centre; 74 patients who had been diagnosed as diabetes as per WHO criteria, 38 (46.2%) were diagnosed during routine examinations and more than half of the patients i.e. 40 (54.1%) presented with some signs/symptoms. Among the diagnosed patients the most common presenting symptoms was found out to be polyuria 23 (31.1%) and weight change 17 (23%). The similar study done by PH Rayappa KNM Raju et al [9] most common symptom at the time of diagnosis was generalized body ache (56.6%) which is followed by increase frequency of micturation (48.7%).

It has been known fact that only moderate life style modification is needed for good glycaemic control among the type 2 diabetic patients. In this study there is significant improvement in all life style modification parameters after

DPE with statistical significance (p value <0.005). The main concern for India regarding the diabetes management is that most of patients are fail to understand the roles of dietary modification, regular physical exercise for their glycaemic control. Also essential monitoring parameters like checking blood sugar level, blood pressure and ophthalmic checkups are done only in half the patients. So in this study it has been demonstrated that there is specific role of DPE in life style modification among type 2 diabetic patients. A study done by Goldhaber et al[10] have reported that there was improvement in Glycaemic control i.e. HbA1c decreases by 1-2% by active Medical Nutrition and life style modification education. In the present study after DPE, out of 272 patients 121(44.49%), 124(45.59%) and 125(45.96%) patients were maintaining their diabetic diet, had restrict the added salts in their diet and were doing regular physical exercise respectively. The study done by shah et al and priyanka et al [11, 12] in which 75 (64%) participants had adopted life style modifications like regular physical exercise, dietary modification after proper diabetes education.

Such life style modification is not only useful to maintain glycaemic control but it will also helps to maintain the blood pressure in them which is considered to be the most common complication among type 2 diabetes. In this study there is it can be seen that even a mild glycaemic control and slight decrease in blood pressure and weight (as suggested by decrease in BMI) can be achieved through community based DPE.(p value <0.001). This can be confirmed with the study done by Mani UV, Srivastava R et al [13] in SSG hospital in baroda Gujarat that by Imparting DPE even for month resulted in a significant decrease in both the fasting and postprandial blood sugar levels with appreciable changes in glcosylated haemoglobin levels. Similarly The study done by Saurav ghosh et al[14] in S.D. medical hospital Muzaffarnagar, Uttar Pradesh., revealed that through patient counselling and regular weekly follow up of 22 type 2 diabetic patients leads to significant decrease in both fasting and postprandial blood sugar level. The study carried out by Shabbidar S et al[15] at the Department of Food and Nutrition, Iran, to assess the effectiveness of dietary education in reducing weight among type 2 diabetes. The intervention group lost 1.5 ± 2.2 kg as against a weight gain the control group of 0.5 ± 2.3 kg ($P < 0.01$).

Conclusion

Most of patients were diagnosed as diabetes within last 3 years at government hospitals during their routine checkups. Most of the patients didn't have any symptoms at the time of diagnosis i.e. they are in an asymptomatic phase at the time diagnosis. The continuous intensive community based DPE done to all 272 diabetic patients in batches for period one year has significantly improved the glycaemic control, life style and self care practices.

Recommendations

1. Since diabetes is an ice berg disease, early diabetes screening program especially in slum area need to be implemented to diagnose the borderline or asymptomatic diabetic patients. All such patients should be involved in Community DPE after their diagnosis.
2. Along with medical prescription every patient should be given continuous DPE to improve their gylcemic level, life style and self care practices.

Limitation: Glycosylated HB Hb1Ac is good indicator of glycaemic control but in this it is measured with fasting and postprandial blood sugar level. Though the DPE sessions were arranged according to the feasibility of each batch but sometimes it was quite cumbersome to arrange all the patients from particular group.

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Table no. 1: Characteristic features of type 2 diabetic patients

	N	**%**
Age wise distribution of patients		
40 to 45	75	27.57
45 to 50	100	36.76
50 to 55	78	28,68
more than 55	19	6.99
Sex wise distribution of patients		
Female	182	66.9
Male	90	33.1
Place of diagnosis		
Government Hospitals	203	74.63
Private Practitioner from the community	52	19.12
Private hospitals	17	6.25
Duration since Diagnosis		
6 months to 12 months	44	16.18
12 months to 24 months	121	44.49
24 months to 36 months	83	30.51
36 months to 48 months	11	4.04
Mode of diagnosis		
During routine check-up as doctor advised	192	70.59
Suffering from some symptoms or complication	62	22.79
During Pre-operative check-up	18	6.62
Symptoms at the time of Diagnosis		
Generalized tiredness& body ache	61	22.43
Increase frequency of urine	38	13.98
Excessive thirst	21	7.21
More Eating	18	6.62
Felt weak	11	4.04
Infection and delayed wound healing	8	2.95
No symptoms	115	42.77
Total	**272**	**100**

Table no 2: Impact of DPE on Life style modification factors

Life Style modification factor		Yes		No		Total	p value
		N	%	N	%		
Maintaining Diabetic diet	Pre intervention	70	25.74	202	74.26	272	<0.001
	Post intervention	121	44.49	151	55.51	272	
Restriction of added salts in regular food consumption	Pre intervention	66	24.26	206	75.74	272	<0.001
	Post intervention	124	45.59	148	54.41	272	
Doing regular physical exercise for 30-45 mins for maintaince of weight	Pre intervention	83	30.51	189	69.49	272	<0.001
	Post intervention	125	45.96	147	54.04	272	
Restriction of junk foods, sweets and high glycemic indexed food items	Pre intervention	32	11.76	240	88.24	272	<0.001
	Post intervention	110	40.44	162	59.56	272	
Proper spacing of meals	Pre intervention	19	6.99	253	93.01	272	<0.001
	Post intervention	161	59.19	111	40.81	272	

Table no.3: Impact of DPE on self care practices

Self care practices		Yes		No		Total	p value
		N	%	N	%		
Taking Medical prescription along with them while travelling	Pre intervention	89	32.72	183	67.28	272	<0.001
	Post intervention	137	50.37	135	49.63	272	
Maintaining blood sugar and blood pressure record	Pre intervention	43	15.81	229	84.19	272	<0.001
	Post intervention	75	27.57	197	72.43	272	
Going for regular laboratory & ophthalmological examination	Pre intervention	45	16.54	227	83.46	272	<0.001
	Post intervention	114	41.91	158	58.09	272	
Carrying sugar pockets for prevention of hypoglycaemia	Pre intervention	49	18.01	223	81.99	272	<0.001
	Post intervention	128	47.06	144	52.94	272	

Table No 4: Impact of DPE on Glycaemic status and other parameters

Parameter		**N**	**Mean**	**Std. Deviation**	**Paired t test**	**P value**
Fasting blood sugar level	Pre intervention	272	135.6	14.79	6.217	<0.0001
	Post intervention	272	132.18	14.63		
Postprandial blood sugar level	Pre-intervention	272	158.03	18.47	6.479	<0.0001
	Post intervention	272	153.45	17.25		
Systolic blood pressure	pre intervention	272	133.99	10.27	9.522	<0.0001
	Post intervention	272	126.94	8.08		
Diastolic blood pressure	pre intervention	272	78.43	7.97	1.999	<0.05
	post intervention	272	77.18	0.48		
Weight	pre intervention	272	61.61	0.35	9.272	<0.0001
	Post intervention	272	60.36	0.37		
BMI	pre intervention	272	27.58	0.17	8.888	< 0.0001
	Post intervention	272	27.02	0.17		