

IMPACT OF HEALTH EDUCATION ON KNOWLEDGE, ATTITUDE, SELF CARE PRACTICES AND LIFE STYLE MODIFICATION FACTORS IN DIABETIC PATIENTS

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ABSTRACT

Introduction: According to the recent World Health Organization report, India today leads the world with over 32 million diabetic patients and this number is projected to increase to 79.4 million by the year 2030. There is an increasing amount of evidence that the patient education is the most effective way to lessen the complications of diabetes and its management. The present study is carried out to determine the effect of health education on knowledge regarding diabetes, adopting healthy life styles and improving self care practices.

Material and Methods: A Community based descriptive epidemiological interventional study was conducted at Cheetah Camp urban slum, which is a field practice area of Department of Preventive and Social Medicine, of T.N. Medical College Mumbai. Diabetic patients above 40 years of age were included in this study. The information was gathered by personal interview using semi-structured schedule.

Results: Out of 272 Type 2 diabetic patients, 182 were females and 90 were males. Before intervention 88.2%, 88.7%, 83.8% patients had poor knowledge, attitude and practices respectively which decreased to 21.76%, 25.1%, 33.81% respectively. There was also improvement in self care practices and life style modification factors.

Conclusions: Health education plays a significant role in increasing knowledge about diabetes and motivates patients to adopt healthy lifestyle. Significant improvement in self care practices and diabetic status of patients was seen after health intervention.

KEYWORDS: Diabetes, Health Education, KAP, Urban Slum

INTRODUCTION

Diabetes mellitus is a group of metabolic disorders characterized by hyperglycemia. The epidemic of diabetes mellitus is ever increasing in developed and developing countries in spite of the enormous facilities available to control its growth. Diabetes is no longer to be considered as a disease of affluent nations alone, it has become a global problem and is a main cause of morbidity and mortality in all developed as well as developing countries. It is estimated that 20 percent of the current global diabetic population resides in South East Asia region. The prevalence of diabetes is rapidly rising all over the globe at an alarming rate Although there is an increase in the prevalence of type 1 diabetes also, the major driver of the epidemic is the more common form of diabetes, namely type 2 diabetes, which accounts for more than 90 per cent of all diabetes cases. Type 2 diabetes is the commonest form of diabetes globally as well as in India.

It constitutes more than 95% of the diabetic population in our country. The prevalence of diabetes has shown increasing trend in the last three decades in India. The number of people with diabetes in India, currently around 40.9 million is expected to rise to 69.9 million by 2025 unless urgent preventive steps are taken.¹

There is an increasing amount of evidence that the patient education is the most effective way to lessen the complications of diabetes and its management. Education is likely to be effective if we know the characteristic of the patients in terms of knowledge, their attitude and practices about diabetes. The present study is carried out keeping in view the above considerations, mainly the effect of diabetes education on type 2 diabetic subjects. The main focus is on how to maintain the blood sugar level within normal range by adopting the healthy life style, how to 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 and maintain optimum weight by doing regular moderate physical exercise.

MATERIAL AND METHODS

The study was conducted at Cheetah Camp urban slum which is a field practice area of Department of Preventive and Social Medicine, of parent Medical College. This is situated at an eastern suburb of Mumbai which comes under the jurisdiction of M East Ward of Municipal Corporation of Greater Mumbai. The population of Cheetah Camp consists of people who have migrated from different parts of India, mainly from Uttar Pradesh, Bihar, West Bengal, Madhya Pradesh, Andhra Pradesh and Tamil Nadu. They have migrated to Mumbai in search of job and are now engaged in small scale industries like Zari work, Bag making, Mat weaving, Carpentry, tailoring etc. Most of the men are self employed and women are house wives, maid servants or vegetable vendors. Study population was selected from Diabetic patients of age 40 years & above. Necessary approvals were taken from Dean of Medical College, Institutional Ethical Committee, Head of Department of PSM and Head of Cheetah Camp UHC.

The present community based descriptive epidemiological interventional study was conducted during the period of October 2010 to September 2012. According to NFHS data 2005-06, the population of more than 40 years is around 25.8%. Now applying this to the population of cheetah camp (population of study area = 1, 22,000), Population of more than 40 years would be around 29,514. The prevalence of type 2 diabetes is around 9.3% in Mumbai,² so total type 2 diabetics would be around 2711. Now taking 10% of this population, final sample size would be around 272. This study was conducted in the following 6 phases-

- Preparatory Phase: October 2010 to December 2010 (3 months)
- Phase of rapid survey: January 2011 to March 2011 (3 Months)
- Phase of Pre Intervention Data Collection: April 2011 to June 11 (3 months)
- Intervention Phase: July 2011 to June 2012 (12 months)
- Phase of Post Intervention Data Collection: July 2012 to September 2012 (3 months)
- Phase of Data Analysis: October 2012 (1 month)
- Documentation Phase: November 2012 to December 2012 (1 month)

Semi structured interview schedule was constructed relevant to the study. This interview schedule was tested by pilot study on 25 Diabetic patients attending geriatric clinic in Urban Health Center. Appropriate changes were done based on pilot study and the interview schedule was finalized. A checklist was prepared for interview schedule, observation and Health education session. Voluntary consent form was prepared in English, Hindi and Marathi.

By taking, inclusion and exclusion criteria into consideration, total 272 known Diabetic patients were selected by employing simple random sampling method. Home visits were done between 10.00 am to 4.00 pm on working days.

The necessary information such as socio demographic profile, Knowledge, attitude and practice about diabetes is collected with the help of semi-structured, pre tested questioner and after taking verbal consent. A necessary examination such as weight, blood pressure blood sugar and urine examination was done with the appropriate technique in an urban health centre. All the Participants were registered in Geriatric clinic in urban health centre and followed up for 12 months from July 2011 to June 2012 for Intervention. Each diabetic patient had given one individual number like 1/2011 to 272/2011. Regular follow up and monitoring of weight, blood pressure and medical history was maintained in that register. If patients were having some serious problem then they have been referred to higher hospitals.

Formation of Batches and Fixing of Timing: Total 272 patients were grouped in to 8 batches. Each batch comprised of 30 to 35 patients. All the participants were told to attend the health education session on particular day. Depending on the feasibility of all the patients of particular batch the timing was decided. Such health education was conducted every week (preferably in morning hour) from 10:15 am to 11:00 am.

All Patients were motivated to attend the health education session in batches on particular day. Health education sessions were headed by the 2 doctor's team. The health education was given in local language.

Health Education Sessions: After assessing their knowledge, attitude and practice towards the diabetes, they have been given health education about diabetes in batches. In 45 minutes of one health education session following topics were covered like,

- Basic information about Diabetes and its symptoms and complications
- What type of food should be or should not be taken by diabetic patient.
- Role of taking regular prescribed medicines and insulin injection.
- Importance of regular follow-up for their physical examination, foot examination, blood pressure and weight check up.
- Importance of Diet control and regular physical exercise in controlling Blood sugar.
- Motivation of the patients to change the life style and self care practices.
- Patients were also given information about hypoglycaemia and how to prevent it and what to do in hypoglycaemic episode.

So, over a period of two months, 8 batches were covered. Such health education sessions were given in batches every 2 monthly. So, over a period of one year each batch got at least 3 health education sessions.

Personal One to One Counseling: This is especially given to those who have some difficulty during health education session.

Dietary Counseling: Dietary counseling was done during follow up visits at UHC with the help of dietician. Each batch has been given information about different types of foods which are harmful or beneficial in diabetes and spacing of meals and maintaining a diabetic diet.

Blood Sugar Examination: Blood sugar (fasting and postprandial) was monitored once in a three months in the laboratory of urban health centre. Each Patient from one batch was given appointment on particular day.

Eye Check up: Each patient motivated to come for their eye check-up which was done by Ophthalmologist. After completion of 12 months of intervention, information was collected about their knowledge, attitude, practice, Life style

modification and self care practices towards the diabetes. The blood sugar examination was carried out in laboratory of urban health centre.

Appropriate scoring was done for assessment of knowledge, attitude and practice in both pre intervention and post intervention phases. The Life style and self care improvement was also done at the end of intervention and compared with pre intervention phase. The collected data was numerically coded and entered in Microsoft excel 2007, and then transferred to SPSS version 15. Added data was analyzed with appropriate test like Chi-square test/Mac-Nemer test to see the association between Pre and post interventional Parameter and for Ordinal and categorical data, wilcoxon signed rank test was used, with P value 0.05 considered as significant.

Assessment of Knowledge, Attitude and Practice of the Patient

Knowledge about Diabetes

- Do you know what Diabetes is? Yes/ No. If yes then if patient able to say
 - High sugar in the body – Mark 1
 - If patient able to say insulin abnormality leads to hyperglycaemia – Mark 2
 And if No – Mark 0
- Do you think more and more people are suffering from Diabetes?

If Yes – mark 1, If No – Mark 0
- Do you know, what is the recommended blood sugar level (Fasting/ Postprandial) for of Diabetic Patient?

If Yes - Mark 1, If No - Mark 0
- Do you know what the symptoms of Diabetes are?

If Yes –Mark 1, If No – mark 0
- Do you know what the complications of diabetes are?

If Yes –Mark 1, If No – Mark 0
- Do you think that Diet control and exercise acts as central pillar in management of Diabetes?

If Yes – Mark 1, If No- Mark 0

 - Minimum marks were ‘0’ and
 - Maximum marks were ‘7’.
 - Poor scorer: the patient who scored mark up to 4
 - Good scorer: the patients who scored mark more than 4.

Attitude towards Diabetes

If patient has positive response, then they have been allotted 2 marks and if they give negative response then they will have 0 Mark.

- Do you think it’s good to include green leafy vegetable in your daily diet?
- Do you think that it’s good to restrict added salts in your diet?

- Do you think that it's good to restrict Cooking oil in your diet?
- Do you think it's good to have whole fruits rather than to have deserts and sweets?
- Do you think that excess alcohol can worsens the blood sugar level?
- Do you think Regular physical exercise is essential?
 - Minimum marks were '0' and
 - Maximum marks were '12'.
 - Poor scorer: the patient who scored mark up to 6.
 - Good scorer: the patients who scored mark more than 6.

Practice towards Diabetes

Following Question Were Asked-

1. Are you taking regular prescribed medicine and going for regular follow-up?
If Yes Mark -1 and if No Mark - 0
 2. Are you maintaining a diabetic Diet?
If Yes Mark -1 and If No Mark - 0
 3. Are you doing physical exercise to maintain your weight?
If Yes Mark-1 and If No Mark -0
 4. When is your last Eye examination done?
Within last year – Mark 4
Within last two years – Mark 3
Within last three years – Mark 2
Not checked since the diagnosis – Mark 1
 5. What is the frequency of checking blood sugar level?
Once in month – mark 4
Once in three months – Mark 3
Once in year – Mark 2
Not checked since Diagnosis – Mark 1
- Minimum marks were '2' and
 - Maximum marks were '12'.
 - Poor scorer: the patient who scored mark up to 7.
 - Good scorer: the patients who scored mark more than 7.

RESULTS

Total 272 Diabetic patients were examined and their knowledge attitude and practices about diabetes were assessed. Before intervention 88.2%, 88.7%, 83.8% patients had poor knowledge, attitude and practices respectively which decreased to 21.76%, 25.1%, 33.81% respectively. There was improvement in self care practices and life style modification factors. Table 1 shows, after health intervention, improvement in knowledge of patients regarding symptoms and complications of Diabetes. Table 2 reveals that health intervention had significant impact on knowledge, attitude and practices of diabetes patients. In Table 3 and 4, significant improvement was seen after health intervention in practice related aspects, self care practices and life style parameters. Table 5 shows statistically significant difference in blood sugar levels, blood Pressure, weight and body mass index after health intervention.

DISCUSSIONS

In this study, before intervention patient had poor knowledge, attitude and practices which improved significantly after health intervention. The low score of Knowledge, attitude and practice was mainly due to illiteracy, low socioeconomic class of the patients. Also, it was found that the knowledge, attitude and practice score was less in females when compared to males. Patients having poor practice scores had poor glyceemic control.

The cross sectional study done in Ludhiana by Gulabani et al. ³ regarding diabetes knowledge, its treatment and complications among diabetic patient found that mean score of knowledge was 2.84 which is higher in male than that in women and this difference was statistically significant. Chennai urban rural epidemiological study (CURES 9)⁴ revealed that only 19.0% of whole population knew that diabetes could cause complications. Even among those who knew that diabetes could cause complications, 55.7% were not able to specify a single organ which could get affected. Even among the self reported diabetic subjects, only 40.6% were aware that diabetes could produce some complications. Foot problems (23.0%) and kidney disease (17.4%) were the most commonly reported complications.

In the cross-sectional study conducted at Chandigarh by Kaur et al. ⁵ of the 60 diabetic individuals, 48 subjects knew that sweets and fatty foods should be avoided but only 18.3% were avoiding them, monitoring of blood sugar was done by only 46.7%. The interventional study ⁶ of diabetes education programme done by Castillo et al. in Chicago reveals that there was significant improvement in knowledge about the diabetes and hence the diabetes awareness among the patients. This shows that, diabetes awareness can be increased through appropriate community based health education.

The study done by the Saadia et al. ⁷ only 68% of patients had their blood sugar checked within one month. Only 16% had eye examination done in last month. Ideally diabetic patients should undergo eye examination yearly. But in this study majority of patients 232(85.3%) have not undergone their eye examination. The reason for not doing the eye check up is that they were not told about the importance of regular eye check up by their doctor. After health education this was corrected by the fact that only 65(23.91%) have not able to Checked their eye.

A study carried out by Shabbidar et al. ⁸ at the Department of Food and Nutrition, Iran, to assess the effectiveness of dietary education in reducing plasma glucose levels in patients with type 2 diabetes. The intervention group lost 1.5 ± 2.2 kg as against a weight gain in the control group of 0.5 ± 2.3 kg ($P = 0.01$). Fasting plasma glucose decreased 21 ± 55 mg/dl in the intervention group and increased 19 ± 78 mg/dl in the control group ($P = 0.028$). Glycosylated haemoglobin decreased $1.9 \pm 2.1\%$ in the intervention group and $0.2 \pm 2.2\%$ in the control group. But there have been very few attempts in India. The study done by Iyer et al. in Vadodara, Gujarat shows that through IPC(interpersonal counselling) and NHE (Nutritional health education) to the diabetic patients for 4 months led to a significant reduction in the fasting blood

glucose (FBG; 14.2%) and HbA1c levels indicating a physiologic fall with good metabolic control.

Satpute et al.¹⁰ in their study assessed the impact of patient counselling, Nutrition and Exercise in patients with Type-2 Diabetes Mellitus. A total of 35 patients with type-2 diabetes were involved. Glycosylated haemoglobin (HbA1c), Fasting plasma glucose, PPBS, total cholesterol, triglyceride, HDL, LDL and BMI were measured at baseline and the end of the study. It was shown that glycemic control of type-2 diabetic patients can be improved through patient counselling regarding disease, medication, diet and exercise. So this shows that there is role of health education in diet modification, change in life style and improvement in glycemic status of diabetic patients. The study done by Mani et al.¹¹ in SSG hospital in Baroda, Gujarat revealed that by Imparting DPE (diabetic patient education) for a month resulted in a significant decrease in both the fasting and postprandial blood sugar levels with appreciable changes in glycosylated haemoglobin levels. This indicates that an intensive diabetic education programme even in our set up brings out short term beneficial aspects to diabetic patients.

RECOMMENDATIONS

Significant improvement in awareness and diabetic status of patients was seen after health intervention. Thus, people have to be educated through effective standardized diabetes education programme. Patients with diabetes should be encouraged to adopt the healthy life style such as dietary modifications, regular physical exercise to reduce the risk of complications. There should be continuous motivation of the patient as well as their family member regarding self care practices.

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APPENDICES

Table 1: Impact of Intervention on Knowledge of Symptoms and Complications of Diabetes

| | Pre-Intervention (n=272) | Post-Intervention (n=272) |
|---|-----------------------------|------------------------------|
| Awareness about Symptoms | | |
| Weight Loss | 48 (17.65%) | 58 (21.23%) |
| Polyuria | 36 (13.24%) | 83 (30.51%) |
| Polyphagia | 27 (9.93%) | 75 (27.58%) |
| Polydypsia | 17 (6.25%) | 68 (25%) |
| Delayed wound healing/ulcer | 4 (1.48%) | 47 (17.28%) |
| Difficulty in vision | 0 | 32 (11.77%) |
| Awareness about Complications | | |
| Heart problem and Hypertension | 32 (11.77%) | 91 (33.46%) |
| Kidney problem | 11 (4.04%) | 86 (31.62%) |
| Tingling numbness of feet and hands | 15 (5.52%) | 64 (23.53%) |
| Diabetic foot and ulcer | 4 (1.48%) | 42 (15.45%) |
| Sweating, palpitations & Giddiness (Hypoglycaemia symptoms) | 0 | 62 (22.8%) |
| Ophthalmic problem | 0 | 76 (27.95%) |

Table 2: Impact of Health Education on Knowledge, Attitude and Practice

| Composite Score | | Mean | SD | Percentile | | | Wilcoxon Signed Rank Test | P Value |
|--------------------|-------------------|------|------|------------|------|------|---------------------------|---------|
| | | | | 25th | 50th | 75th | | |
| Score of knowledge | Pre intervention | 0.98 | 1.69 | 0 | 0 | 1 | -7.483 | < 0.001 |
| | Post intervention | 1.67 | 2.30 | 0 | 1 | 3 | | |
| Score of Attitude | Pre intervention | 2.62 | 3.27 | 0 | 2 | 4 | -9.501 | <0.001 |
| | Post intervention | 4.02 | 3.32 | 2 | 4 | 6 | | |
| Score of Practice | Pre intervention | 5.03 | 1.67 | 4 | 5 | 6 | -9.326 | <0.001 |
| | Post intervention | 5.93 | 1.85 | 4 | 6 | 7 | | |

Table 3: Impact of Health Education on Practice Related Aspects

| Frequency of Checking Blood Sugar Level | Pre Intervention (n=272) | | Post Intervention (n=272) | |
|---|-----------------------------|-------|------------------------------|-------|
| | N | % | N | % |
| Monthly | 52 | 19.12 | 110 | 40.44 |
| Three monthly | 55 | 20.22 | 86 | 31.61 |
| Six monthly | 102 | 37.5 | 76 | 27.95 |
| Yearly | 36 | 13.25 | 0 | 0 |
| Not checked | 27 | 9.91 | 0 | 0 |
| When is your Last Eye Examination Done Since you have been Diagnosed as a Diabetic? | Pre Intervention (n=272) | | Post Intervention (n=272) | |
| | N | % | N | % |
| Yearly | 18 | 6.62 | 171 | 62.86 |
| Two yearly | 8 | 2.94 | 23 | 8.45 |

Table 3: Contd.,

| | | | | |
|---|---------------------------------|------------|----------------------------------|------------|
| three yearly | 14 | 5.14 | 13 | 4.78 |
| Not checked | 232 | 85.3 | 65 | 23.91 |
| Are you Taking Treatment Regularly or not? | Pre Intervention (n=272) | | Post Intervention (n=272) | |
| | N | % | N | % |
| Regularly | 160 | 59.2 | 223 | 81.98 |
| Irregularly | 112 | 40.8 | 49 | 18.02 |
| Total | 272 | 100 | 272 | 100 |

Table 4: Impact of Health Education on Life Style Modification Factors and Self Care Practices

| Parameter | Life Style Modification | | Parameter | Self Care Practices | |
|--|--------------------------|---------------------------|---|--------------------------|---------------------------|
| | Pre Intervention (n=272) | Post Intervention (n=272) | | Pre Intervention (n=272) | Post Intervention (n=272) |
| Maintaining diabetic diet | 78 (28.68%) | 56.62 % | Wearing chappals/shoes outside | 83.82 % | 97.06 % |
| Cut down of sweets and high glycemic foods | 19 (6.99%) | 47.05 % | Taking prescription and medicines when going out of station | 53.31 % | 61.77 % |
| Doing regularly physical exercise | 33.46% | 43.04 % | Taking insulin injection by self* | 31.25 % | 81.25 % |
| Restriction of added salts in regular diet | 25.74% | 41.17 % | Carrying sugar pockets with them | 12.5 % | 26.11 % |
| Restriction of cooking oil in regular diet | 24.26 % | 39.71 % | Going for regular blood sugar and urine examination | 19.12 % | 40.44 % |

* Only 16 patients are taking insulin

Table 5: Impact of Intervention on Glycemic Status and Other Parameters

| Parameter | | N | Mean | Std. Deviation | Std. Error of Mean | Paired T Test | P-Value |
|--------------------------------|-------------------|-----|--------|----------------|--------------------|---------------------------|----------|
| Fasting blood sugar level | Pre intervention | 272 | 135.6 | 14.79 | 0.90 | 6.217 | <0.0001 |
| | Post intervention | 272 | 132.18 | 14.63 | 0.89 | Difference is significant | |
| Postprandial blood sugar level | Pre-intervention | 272 | 158.03 | 18.47 | 1.12 | 6.479 | <0.0001 |
| | Post intervention | 272 | 153.45 | 17.25 | 1.05 | Difference is significant | |
| Systolic blood pressure | Pre intervention | 272 | 133.99 | 10.27 | 0.62 | 9.522 | <0.0001 |
| | Post intervention | 272 | 126.94 | 8.08 | 0.49 | Difference is significant | |
| Diastolic blood pressure | Pre intervention | 272 | 78.43 | 7.97 | 0.48 | 1.999 | <0.05 |
| | Post intervention | 272 | 77.18 | 0.48 | 7.97 | Difference is significant | |
| Weight | Pre intervention | 272 | 61.61 | 0.35 | 5.78 | 9.272 | <0.0001 |
| | Post intervention | 272 | 60.36 | 0.37 | 6.04 | Difference is significant | |
| BMI | Pre intervention | 272 | 27.58 | 0.17 | 2.78 | 8.888 | < 0.0001 |
| | Post intervention | 272 | 27.02 | 0.17 | 2.86 | Difference is significant | |

