



Empowerment based educational intervention on self efficacy and glyceimic control –An experimental study

Manjula GB

Diabetes Educator, Samastha Hospitals, Bangalore.

ABSTRACT

An experimental study was conducted to evaluate the effectiveness of empowerment based educational intervention on improving self efficacy and glyceimic control among patients with type 2 diabetes mellitus in a sample of 300 patients randomly allotted to experimental and control group. After baseline assessment, subjects in experimental group received an empowerment based educational intervention. Data was collected from both groups at baseline and third month after intervention. It was found that the mean difference in self efficacy between third month and baseline in all domains and the overall self efficacy and difference in HbA1c values were significantly higher ($p < 0.001$) in experimental group than in control group. It was concluded that empowering patients by improving their self efficacy helps reduce HbA1c values.

KEYWORDS : Empowerment, education, self efficacy, glyceimic control

Background of study

Diabetes incidence across the globe is on the rise. Ramachandran et al (2010) reported that it is expected to rise from 366 million in 2011 to 552 million by 2030. South-East Asia Region contributes to one-fifth of all adults with diabetes in the world. It is seen that of 71.4 million people with diabetes in South East Asia, 61.3 million are in India. Mohan and Pradeepa reported that India is the largest contributor to regional mortality with 983,000 deaths attributable to diabetes. Ramachandran (2001) has shown that the prevalence of diabetes in urban Indian adults was 12.1%. In India, majority has poor glycaemic control and has vascular complications. It is mostly patients' efforts that contributes to improving blood sugar levels. However, patient requires confidence and skills in performing these complex activities. Bandura's self efficacy theory puts forth behavioral methods to increase a person's self efficacy. Self-efficacy is a belief in one's ability to perform a task that will lead to the desired outcome. Empowering patients to improve their self-efficacy is an effective way to enhance patients' compliance with self-care activities.

Material and methods

An experimental study was conducted among 300 out-patients attending a diabetic clinic of a tertiary hospital in Kerala who were randomly assigned to both groups. Assessment was done at baseline and at third month after intervention. Subjects in experimental group received both routine hospital treatment and empowerment based educational intervention. Bandura's social cognitive theory formed the basis of intervention for developing self efficacy skills and empowering them. Control group received routine hospital treatment. Data collected were analyzed using appropriate descriptive and inferential statistics.

Findings

Table 1: Distribution of subjects according to their socio-demographic variables. (N=300)

| Demographic Variables | Experimental group (n=150) | | Control group (n=150) | | χ^2 | P Value |
|-----------------------|----------------------------|-------|-----------------------|-------|----------|---------|
| | f | % | f | % | | |
| Age in years | | | | | 7.429 | 1.000 |
| 1. 31 – 40 | 1 | 0.6 | 3 | 2 | | |
| 2. 41 – 50 | 35 | 23.3 | 33 | 22 | | |
| 3. 51 – 60 | 61 | 40.67 | 64 | 42.67 | | |
| 4. 61 – 70 | 53 | 35.3 | 50 | 33.33 | | |
| Sex | | | | | 1.080 | 0.299 |
| 1. Male | 80 | 53.33 | 71 | 47.33 | | |
| 2. Female | 70 | 46.67 | 79 | 52.67 | | |
| Religion | | | | | 0.127 | 0.938 |
| 1. Hindu | 94 | 62.67 | 91 | 60.67 | | |
| 2. Christian | 36 | 24 | 38 | 25.33 | | |
| 3. Muslim | 20 | 13.33 | 21 | 14 | | |

| | | | | | | |
|---|-----------|------------|-----------|------------|--------|-------|
| Place of residence | | | | | | |
| 1. Urban | 111 | 74 | 114 | 76 | | |
| 2. Rural | 39 | 26 | 36 | 24 | 0.160 | 0.689 |
| Marital status | | | | | | |
| 1. Married | 124 | 82.67 | 125 | 83.33 | 0.024 | 0.878 |
| 2. Separated/ Divorcee/ | 26 | 17.33 | 25 | 16.67 | | |
| 3. Widow | | | | | | |
| Education | | | | | | |
| 1. Graduate or post graduate | 26 | 17.33 | 32 | 21.33 | 8.121 | 0.087 |
| 2. Intermediate or post high school diploma | 55 | 36.67 | 64 | 42.67 | | |
| 3. High school | 41 | 27.33 | 23 | 15.33 | | |
| 4. Middle school | 19 | 12.67 | 16 | 10.67 | | |
| 5. Primary school | 9 | 6.00 | 15 | 10.00 | | |
| Occupation | | | | | | |
| 1. Semiprofession | 11 | 7.33 | 8 | 5.33 | 5.711 | 0.335 |
| 2. Clerical,shop-owner, farmer | 14 | 9.33 | 27 | 18.00 | | |
| 3. Skilled worker | 24 | 16 | 21 | 14.00 | | |
| 4. Semi-skilled worker | 14 | 9.33 | 17 | 11.33 | | |
| 5. Unskilled worker | 14 | 1.33 | 2 | 1.33 | | |
| 6. Unemployed | 2 | 56.67 | 75 | 50.00 | | |
| Income | | | | | | |
| 1. 17900-35799 | 26 | 17.33 | 32 | 21.33 | 6.622 | 0.157 |
| 2. 13420-17899 | 55 | 36.67 | 64 | 42.67 | | |
| 3. 8950-13419 | 40 | 26.67 | 23 | 15.33 | | |
| 4. 5360-8949 | 18 | 12 | 16 | 10.67 | | |
| 5. 1791-5359 | 11 | 7.33 | 15 | 10.00 | | |
| Socioeconomic status | | | | | | |
| 1. Lower middle | 26 | 17.33 | 31 | 20.67 | 11.430 | 0.121 |
| 2. Middle | 43 | 28.67 | 23 | 15.33 | | |
| 3. Upper middle | 81 | 54 | 96 | 64 | | |
| Source of income | | | | | | |
| 1. Self | 38 | 25.34 | 56 | 37.34 | 5.041 | 0.080 |
| 2. Spouse/Children | 112 | 74.66 | 94 | 62.66 | | |
| Lives with | | | | | | |
| 1. Spouse | 54 | 36 | 47 | 31.3 | 8.416 | 0.038 |
| 2. Spouse and children | 70 | 46.7 | 66 | 44.0 | | |
| 3. Children | 22 | 14.7 | 37 | 24.7 | | |
| 4. With other family members | 4 | 2.7 | 0 | 0.00 | | |
| Habits of only male subjects | | | | | | |
| 1. Alcoholism | 21 | 26.25 | 29 | 40.85 | 8.065 | 0.045 |
| 2. Smoking | 7 | 8.75 | 10 | 14.08 | | |
| 3. Both alcoholism and smoking | 24 | 30.00 | 20 | 16.90 | | |
| 4. None | 28 | 35.00 | 12 | 28.17 | | |
| Total | 80 | 100 | 71 | 100 | | |

Table 1 shows that majority of subjects are in the age group 51-60 (40.67%) Majority are males (53.33%) and are Hindus (62.67%). 74% subjects are mostly residing in urban areas. 82.67% are married. 36.67% hold an intermediate or post high school diploma. However, majority of them (56.67 %) are unemployed. Monthly income was 13420-17899 for 36.67%. Majority (54%) belonged to upper middle class. Majority of them lived with spouse and children (46.7%) who also contributed 74.66 % of family income. Among men, 30% had the habit of drinking and smoking.

Table 2: Distribution of subjects according to their morbidity variables. (N=300)

| Morbidity Variables | Experimental group (n=150) | | Control group (n=150) | | χ ² | p Value |
|--|----------------------------|-------|-----------------------|-------|----------------|---------|
| | f | % | f | % | | |
| Duration of diabetes(yrs) | | | | | 26.433 | 0.281 |
| 1. ≤5 | 37 | 24.67 | 25 | 16.66 | | |
| 2. 6-10 | 65 | 43.33 | 58 | 38.67 | | |
| 3. 11-15 | 26 | 17.33 | 39 | 26.00 | | |
| 4. 16-20 | 19 | 12.67 | 20 | 13.33 | | |
| 5. 21-25 | 3 | 2 | 6 | 04.00 | | |
| 6. >25 | 0 | 0 | 2 | 01.30 | | |
| System of treatment followed | | | | | 4.299 | 0.117 |
| 1. Allopathy | | 82.67 | 119 | 79.33 | | |
| 2. Allopathy and homeopathy | | 11.33 | 27 | 18.00 | | |
| 3. Allopathy and ayurveda | | 6 | 04 | 02.67 | | |
| Type of treatment | | | | | 2.815 | 0.061 |
| 1. Oral anti diabetic agents | 115 | 76.7 | 102 | 68 | | |
| 2. Oral anti diabetic agents and insulin | 35 | 23.3 | 48 | 32 | | |
| Starting of oral anti diabetic agents | | | | | 3.439 | 0.064 |
| Soon after diagnosis | 139 | 92.67 | 146 | 97.33 | | |
| 1-3 years after diagnosis | 11 | 7.33 | 4 | 02.67 | | |

| | | | | | | |
|---|-----|-------|-----|-------|-------|-------|
| Adherence to medications for the past one year | | | | | | |
| 1. Regular | 104 | 69.33 | 114 | 76 | 1.678 | 0.195 |
| 2. Irregular | 46 | 30.67 | 36 | 24 | | |
| Self monitoring of GRBS using glucometer | | | | | | |
| Yes | 45 | 30 | 34 | 22.67 | 2.079 | 0.095 |
| No | 105 | 70 | 116 | 77.33 | | |
| Family history of diabetes | | | | | | |
| Yes | 124 | 82.67 | 112 | 74.67 | 2.86 | 0.060 |
| No | 26 | 17.33 | 38 | 25.33 | | |
| Diabetics in the family | | | | | | |
| Father or Mother | | | | | 6.238 | 0.182 |
| Both parents | 73 | 48.67 | 94 | 62.67 | | |
| Siblings/uncle/aunt | 22 | 14.67 | 14 | 09.33 | | |
| Father or Mother and siblings/uncle/aunt | 46 | 30.67 | 36 | 24.00 | | |
| Both parents and siblings/uncle/aunt | 6 | 4 | 4 | 02.67 | | |
| | 3 | 2 | 2 | 01.33 | | |
| | | | | | | |
| Diabetic complications | | | | | | |
| Neuropathy | 38 | 25.33 | 29 | 19.33 | 1.566 | 0.457 |
| Coronary artery disease | 18 | 12 | 20 | 13.33 | | |
| None | 94 | 62.7 | 101 | 67.33 | | |
| Co-morbidities | | | | | | |
| Hypertension | 17 | 11.33 | 22 | 14.7 | 5.763 | 0.124 |
| Dyslipidemia | 8 | 5.33 | 18 | 12.0 | | |
| Both | 67 | 44.67 | 63 | 42.0 | | |
| None | 58 | 38.67 | 47 | 31.3 | | |

Table 2 shows that majority of the subjects (43.33%) are diabetics since past 6-10 years. 82.67 % are following allopathic system of medicines only. Majority of them are treated with only oral anti diabetic agents (76.7%). Majority of subjects (92.67%) were put on oral anti diabetic agents soon after diagnosis. With regard to medication adherence, 69.33% of them were adherent. Usage of glucometer for self monitoring of blood sugars was not a practice in majority of subjects (70%) Family history of diabetes was noticed in 82.62 % of subjects. Either father or mother was a diabetic in 48.67 % of subjects. Neuropathy was the diabetic complication reported in majority of subjects (25.33%). Majority of subjects (44.67 %) had both hypertension and dyslipidemia as co-morbidities.

Table 3: Comparison of domain wise difference in scores of self efficacy between experimental and control group. (N=290)

| Domain wise self efficacy | Difference | Experimental group (n=146) | | Control group (n=144) | | t/ modified t | df | p Value |
|---|------------------------------------|----------------------------|---------|-----------------------|---------|---------------|---------|---------|
| | | Mean/ Median | SD/ IQR | Mean/ Median | SD/ IQR | | | |
| Diet | 3 rd month and baseline | 9.37 | 6.92 | 1.68 | 7.14 | 9.311 | 288.000 | 0.001 |
| Exercise | 3 rd month and baseline | 5.47 | 3.25 | 0.14 | 3.22 | 13.998 | 288.000 | 0.001 |
| Blood sugar monitoring | 3 rd month and baseline | *1.00 | 3.00 | 0.00 | 2.00 | 4.967 | 260.255 | 0.001 |
| Medications and insulin administration | 3 rd month and baseline | *10.00 | 6.00 | 0.00 | 1.00 | 19.123 | 236.321 | 0.001 |
| Foot care | 3 rd month and baseline | *4.00 | 3.00 | 0.00 | 2.00 | 14.434 | 277.563 | 0.001 |
| Overall self efficacy | 3 rd month and baseline | 29.77 | 9.43 | 1.99 | 8.08 | 26.900 | 288.000 | 0.001 |

* Modified t test.

Table 3 shows that mean difference in self efficacy in diet, exercise, blood sugar monitoring, medications and insulin administration, foot care and overall self efficacy between 3rd month and baseline was significantly (p<0.001) higher in experimental group than in control group.

Table 4: Comparison of difference in HbA1c values between experimental and control group. N= (290)

| Laboratory values | Difference | Experimental group (n=146) | | Control group (n=144) | | t/ modified t | df | p value |
|-------------------|------------------------------------|----------------------------|---------|-----------------------|---------|---------------|---------|---------|
| | | Mean/ Median | SD/ IQR | Mean/ Median | SD/ IQR | | | |
| HbA1c | 3 rd month and baseline | 0.940 | 0.501 | -0.100 | 0.565 | 16.560 | 288.000 | 0.001 |

Table 4 shows that the difference in HbA1c value between 3rd month and baseline was significantly (p<0.001) higher in experimental group than in control group.

Discussion

The mean difference in HbA1c values and self efficacy between third month and baseline in all domains and the overall self efficacy were significantly higher ($p < 0.001$) in experimental group than in control group. These findings were supported by studies conducted by Shi (2010), [Mishalia](#) (2013), Sharoni (2014), Zareban (2015). It was concluded that empowering patients by enhancing their self efficacy plays a pivotal role in improving glycemic control among patients with type 2 diabetes mellitus.

REFERENCES

1. Ramachandran A, Wan Ma RC and Snehalatha C (2010). Diabetes in Asia. *Lancet*, 375: 408-418
2. Mohan V, Pradeepa R (2009). Epidemiology of diabetes in different regions of India. *Health administrator*, Vol: XXII Number 1& 2 - 2009 : 1- 18
3. Ramachandran A, Snehalatha C, Kapur A, et al (2001). High prevalence of diabetes and impaired glucose tolerance in India. National Urban Diabetes Survey. *Diabetologia*; 44 : 1094-101.
4. Shi Q, Ostwald SK, Wang S. (2010). Improving glycaemic control self-efficacy and glycaemic control behaviour in Chinese patients with type 2 diabetes mellitus: randomised controlled trial. *J Clin Nurs*. 19(3-4):398-404.
5. Mishalia M, Omera H ,A D Heymannb DA (2011). The importance of measuring self-efficacy in patients with diabetes. *Family Practice* 28 (1): 82-87.
6. Sharoni AS, and Wu VS. (2012). Self-efficacy and self-care behavior of Malaysian patients with type 2 diabetes: a cross sectional survey. *Nursing and Health Sciences* 14, 38–45
7. Zareban I, Niknami S, Rakhshani F.(2013). The Effect of Self Efficacy Education Program on reducing Blood Sugar Levels in Patients with Type 2 Diabetes, *Health Education & Health Promotion* Vol. 1 (1): (67- 79)