



Research Article

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A STUDY TO EVALUATE THE EFFECTIVENESS OF DIABETIC SELF-MANAGEMENT TRAINING PROGRAMME ON PHYSIOLOGICAL, PSYCHOLOGICAL AND ECONOMIC PARAMETERS OF DIABETIC CLIENTS IN A SELECTED SETTINGS: A PILOT STUDY

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ABSTRACT

Managing diabetes is a multidisciplinary task by keeping the affected person under the care of the system. The aim of the study was to evaluate the effectiveness of the diabetic self-management training program on physiological, psychological and economic parameters. A true experimental design with simple random sampling was followed to study the experimental and control group. Pretest was done by assessing the demographic variables, physiological, psychological and economic parameters of the diabetic clients in both the groups. The experimental group underwent a diabetic self-management training program. After three months the same parameters were assessed in both the groups. There was no significant difference found in physiological variables in pre and posttest of control group except in PBS and in FBS. In case of experimental group, the difference was statistically proved in the parameters like weight, BMI, PPBS, FBS, HbA1C, Cholesterol, with the t value of 3.876 (P=0.01), 3.09 (P=0.06), 5.418 (P=0.0001), 4.689 (P=0.0001), 6.950 (P=0.0001), 5.145 (P=0.0001) respectively. The psychological parameters like wellbeing, QOL showed a significant improvement after the intervention and there was a reduction in the depression score where as in the control group there was no difference found between pre and posttest. There was a significant reduction in direct and indirect cost of care among the samples in the experimental group after the intervention. Thus the Self-management training program is effective in glycemic control, promoting wellbeing and QOL and reducing the incidence of depression.

Keywords: Self-management training, physiological variables, psychological variables, economic parameters, diabetic clients.

INTRODUCTION

Diabetes mellitus is a disease known from 1500 BC. Ancient Egyptian were aware about the disease. Diabetes is a challenge to the health care professionals from the ancient period. Despite knowing the seriousness of diabetes since long we haven't seen a reduction in the prevalence of diabetes, but a rapid rise in the rate of prevalence. Every seven seconds someone dies in some part of the world with diabetes thus accounting for 4.8 million deaths globally every year. This disease is one of the greatest challenges of the country and remains on a relentlessly upward trajectory¹. According to International Diabetic Federation, in the year 2014 worldwide about 387 million people were affected with diabetes, majority of them were between 40 and 59 years and 80% of them live in low and middle income countries². The prevalence is fastest in developing countries. Death rate for diabetes mellitus has increased globally. Hot spots include Middle East, Central America, Europe and South East Asia. India and China will make up one third of total number of diabetics in the world by 2025³. The changes in life style put people at risk of diabetes. As a result of increased prevalence of diabetes huge amount of money is spent on diabetes care which leads to economic burden, especially among the poor section of the society. It requires national endeavors for early diagnosis, effective management and for primary prevention⁴.

As the number of people with diabetes grows worldwide the disease occupies an ever increasing proportion of national health care budgets. The diabetic epidemic will continue to grow without primary prevention. Diabetes is projected to become one

of the world's main disablers and killers within the next 25 years. The prevalence of type II diabetes mellitus is rising in an alarming scale at India which poses a major threat to clinical management, economic growth and social wellbeing⁵. If this is not attended effectively this will affect the country's growth and development directly and indirectly. Immediate action is needed to stem the tide of diabetes and to introduce cost effective treatment strategies to reverse this trend. Primary health centers have to be strengthened to manage the rising burden of diabetes and hypertension with efforts to provide promotive, preventive, curative and rehabilitative services at the grass root level⁶.

WHO report 2010 reveals that over a billion people are unable to access the health services they need, while a 100 million people are below poverty line and 150 million people face constraints hardship. A study of 3150 households from West Bengal revealed that among house holds who accessed health services, the expenditure of households on chronic illness was found to be 5.16% of total household expenditure. The regression analysis also revealed that households who had chronic illness had a higher risk of incurring catastrophic health expenditures as compared to members who had sought out patient care. A study which used the sub sample of a National survey suggested that information from 438 individuals hospitalized for DM found that hospital costs represented 17% of annual total household expenditure. The poor households had a significantly higher burden.

People with diabetes must have the knowledge and necessary skill to manage their day to day activities as part of the effective

management of the disease. Planned teaching method is one of the best methods to impart knowledge and to improve the healthy behavior. Education is not just a part of the treatment, but it is a treatment⁷.

The Diabetes education not only aims at achieving glycemic control but also preventing complications, disability limitation and rehabilitation. There are seven self-care behaviors found to be positively correlated with good outcome such as dietary management, exercise, monitoring, and compliance with medication, problem solving skills, healthy coping and risk reduction behaviors⁸.

There is a gradual increase in the direct cost incurred by the family on diabetes. The urban and rural patients spend a large percentage of income on diabetes management. The economic burden of urban families in developing countries is rising and the total direct cost has doubled from 1998 to 2005⁹.

In India no accurate data on diabetes and its impact is available. There is a need for a larger scale well planned national study which could provide reliable nationwide data not only on prevalence of DM but also on pre diabetes and the complications of DM in India. A study of this nature will have enormous impact on the public health impact will also help policy makers to take suitable action against DM in India.

Statement of the problem

Having limited resources and increasing demand from competing programs, policy makers and health care providers seek guidance from economic studies on how to use health care resources wisely. Many economic studies mainly focused on estimating the cost of diabetes and cost effectiveness of different interventions. These studies found that diabetes is costly and its cost also will continue to increase. Hence it is required that more resources to be allocated to find the cost effective intervention to manage diabetes.

The present study aimed at analyzing the cost of diabetic care and the role of self-management training in glycemic control, preventing complications and improving quality of life.

“A Study to evaluate the effectiveness of diabetic self-management training program on physiological, psychological and economic parameters of diabetic patients in selected settings – A Pilot study”

Objectives

General Objective

Diabetic self-management training promotes glycemic control, enhances psycho social outcomes, reduces the treatment cost, prevents complications and promote quality of life.

Specific Objectives

1. Assess the physiological, psychological and economic parameters of diabetic clients in experimental and control group.
2. Assess the self-care among diabetic clients in experimental and control group
3. Evaluate the effectiveness of diabetic self-management program

Hypotheses

- H1. There is a significant difference in glycemic control between the experimental group and the control group.
- H2. There is a significant difference in the psycho social parameters between the experimental group and the control group.
- H3. There is a significant difference in the economic parameters between the experimental group and the control group.
- H4. There is a significant difference in the Quality of life between the experimental group and the control group.

METHODOLOGY

Research Design

The research design for the present study is true experimental study design. This design studies the casualty by introducing an intervention to one group and comparing the outcome with another group that has not experienced the intervention. Subjects are randomly assigned to each group.

Settings

500 bedded Karuna medical college hospital at Palakkad, Kerala and Kovai diabetic specialty centre, Coimbatore were selected as the setting for the study.

Sampling

Twenty samples from each selected setting were enrolled in the study. After obtaining informed consent by using simple random sampling technique patients were assigned in control and experimental group. Assigned 10 patients in experimental and 10 in control group at Palakkad. In Coimbatore also patients were assigned as in Palakkad.

Inclusion Criteria

- Those who were diagnosed to have diabetes mellitus and without any complications
- Those who are between the age group of 20 – 60 years
- Those who can read and write the local language

Exclusion Criteria

- Individuals diagnosed to have diabetes mellitus with any minor or major complications or with any other associated illness.
- Individuals those who have learning difficulties
- Those who cannot read and write the local language.

Tool for Data Collection

The tool contains the following items.

- a. Tool to assess the demographic characteristics.
- b. Tool to assess the diabetic profile of an individual
- c. Tool to assess diabetic self-care
- d. WHO tool to assess wellbeing
- e. Tool to assess the direct and indirect cost of diabetic care.
- f. Tool to assess quality of life
- g. Depression scale to assess the level of depression.

Method of Data Collection

The data were collected using structured interview schedule. The pretest was conducted to all subjects in the control group. They received routine treatment. After three months' posttest was conducted for the subjects. After this the pretest was conducted for the subjects in experimental group. The subjects in the experimental group were given training on self-management of Diabetes for about 2 hours. The concepts included in the training program were introduction about

diabetes and glucose regulation, Introduction of the concept of self-management and its uses, dietary management, exercise, foot care, monitoring of diabetes including important blood tests, identification, prevention and management of hypo and hyperglycemia, Prevention, early identification and management of diabetic complications, Care of vital organs, Medications, Measures to promote mental health, Role of lifestyle modification in the management of diabetes, Cost of treatment and ways to reduce it. The subjects were assembled in the lecture hall. Used PowerPoint presentation to conduct the training. Participants have actively participated in the session. At the end of the session their doubts were clarified and each subject was given with an information booklet on diabetic self-management. After three months conducted posttest for the subjects in the experimental group.

Statistical Analysis

The collected data were analyzed by using descriptive and inferential statistics. The difference between and within the group and the association between self-care and the selected demographic and physiological variables were analyzed. Paired t test was used to find the difference between pretest and posttest in the control and experimental group. Independent t test was used to find the difference in the parameters between control and experimental group.

Ethical Clearance

Ethical clearance was obtained from the Institutional Ethics Committee with reference to the certificate number KMC/Cert/09/2014/10 dtd 3/9/14 and obtained informed consent form from all the participants.

RESULTS

The demographic variables assessed in this study were age, gender, marital status, educational status, employment status, family income, and family size. Statistically no significant difference was found between the experimental and control group. Variables like duration of illness, history of smoking and alcoholism and the details of previous training attended were also assessed. There was no significant difference found between both the groups. The distribution of samples according to their demographic variables were described in the figure 1,2,3,4 and 5. It was identifying that none of them attended a self-management of diabetes training before.

Table 1 described the difference in clinical parameters like weight, BMI, PPBS, FBS, HbA1C and cholesterol within and between the control and experimental group before and after the intervention. It was statistically proved that there is a significant difference in weight between control and experimental group. In experimental group there is a significant reduction in weight was observed during the post test.

The difference in BMI between and within groups were calculated. The result was same as weight. There was a significant reduction in post prandial blood sugar and fasting blood sugar in the experimental group after the intervention whereas there was significant difference in the fasting blood sugar during the posttest between experimental and control group. It was found that there was a significant reduction in the mean HbA1C in both the groups during the post test, but the reduction in the level of HbA1C in the experimental group during the post test was markedly higher than the control group.

Total cholesterol was also taken for calculation and the same result was same as of HbA1c.

Psychosocial parameters were assessed in terms of wellbeing, depression and quality of life before and after the intervention. Table 2 describes the details of psychological parameters of the diabetic clients in both control and experimental group before and after the intervention. It was observed that there was no significant difference identified with in the groups during the pre and posttest, but there was a difference found between control and experimental group during the post test. There was a reduction in depression score in the experimental group during the post test and also a difference was identified between experimental and control group during the post test. There was a marked change in the QOL of clients in the experimental group after the intervention. It was also noted that there was a significant difference between experimental and control group during the post test.

The direct and indirect cost incurred by the clients for diabetic management were presented in table 3. It was analyzed and the results reveal that there is a significant reduction of direct and indirect cost in the experimental group after the intervention. There was a significant difference in the indirect cost incurred by the clients between control and experimental group after the intervention.

Self-care scores of the diabetic clients within and between the groups were analyzed and presented in table 4. The results showed a significant difference between the pretest and post test scores of individuals in the experimental group. There was no significant difference found between the groups during pre and posttest.

It was also found that there is a significant relationship between self-care and PPBS, FBS and HbA1C during the post test in the experimental group and there was a correlation between self-care and QOL in the control group in the post test.

DISCUSSION

Self-management is a complex and dynamic process which is to be deeply rooted in one's life. This requires support from various health team members¹⁰. There are evidences that nurses are capable of making the clients understand the condition and to adopt a healthy behavior in their day to day life. Because life style plays an important role in the management of diabetes¹¹. Knowledge, physical skills, emotional factors and self-efficacy are the factors which determine self care¹². Studies proved that the glycemic control was better in the people who were adherent to self-care than those who neglected it¹³

The present study aimed to evaluate the effectiveness of self-care training, collected relevant data from the samples. Conducted a self-care training program for the participants in experimental group. Independent t test, paired t test and correlation and co efficient were used to statistically prove the effectiveness of self-care training on physiological, psycho social and economic variables. Evidence support that self-management training is effective in glycemic control for a limited period. So the clients are in need of continuous support and motivation to strictly follow the self-care guidelines¹³. Self-care training resulted in a marked reduction in HbA1C and in maintaining healthy weight¹⁴ thus proving that there is relationship between self-care and glycemic control¹⁵.

Table 1: Physiological measurements of the samples before and after the intervention

Parameter	Group	Mean ±SE	Significance paired t test		Significance unpaired t test	
			Exp pre & post test	Cont pre & post test	Exp & cont pre test	Exp & cont post test
Weight	Exp pre test	73.65± 2.99	t = 3.876 P< 0.01	t = -0.577 NS	t = 0.87 NS	t = - 1.17 NS
	Exp post test	72.69± 2.92				
	Cont pre test	77.11± 2.58				
	Cont post test	77.24± 2.54				
BMI	Exp pre test	28.91± 1.19	t = 3.09 P< 0.01	t = -0.545 NS	t = -1.798 NS	T = 2.206 P<0.05
	Exp post test	28.38± 1.15				
	Cont pre test	31.90± 1.15				
	Cont post test	31.95± 1.27				
PPBS	Exp pre test	271.25± 26.43	t = 5.418 P< 0.001	t = 1.758 NS	t = -0.24 NS	t = -3.11 P<0.01
	Exp post test	185.1± 14.06				
	Cont pre test	280.30± 25.21				
	Cont post test	257.15±18.36				
FBS	Exp pre test	167.6±15.54	t = 4.686 P<0.001	t = 0.795 NS	t = - 0.825 NS	t = -3.76 P<0.05
	Exp post test	124.25± 8.13				
	Cont pre test	186.05±16.04				
	Cont post test	179.90± 12.36				
HbA1C	Exp pre test	10.56±0.66	t = 6.950 P<0.001	t = 3.495 P< 0.05	t = 0.43 NS	t = - 2.23 P<0.05
	Exp post test	7.98±0.40				
	Cont pre test	10.21±0.48				
	Cont post test	9.49±0.49				
Cholesterol	Exp pre test	201.7±7.89	t = 5.145 P< 0.001	t = 2.008 P<0.05	t = -0.14 NS	t = - 2.09 P<0,05
	Exp post test	169.85±9.54				
	Cont pre test	203.70±10.83				
	Cont post test	197.7±9.26				

Table 2: psychosocial measurements of samples before and after the intervention

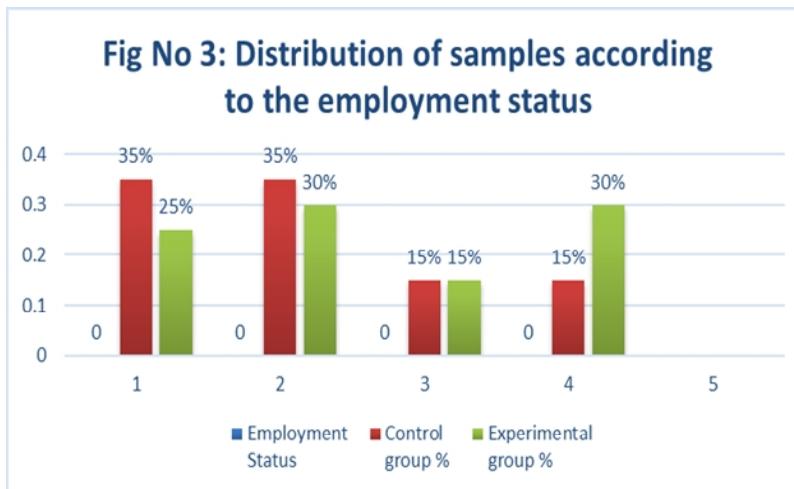
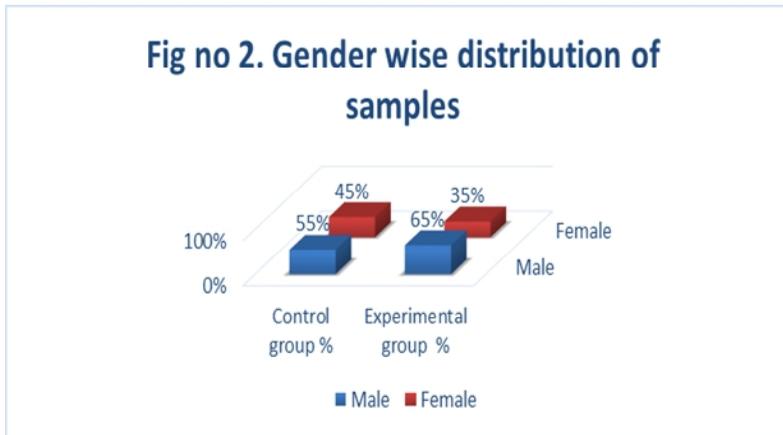
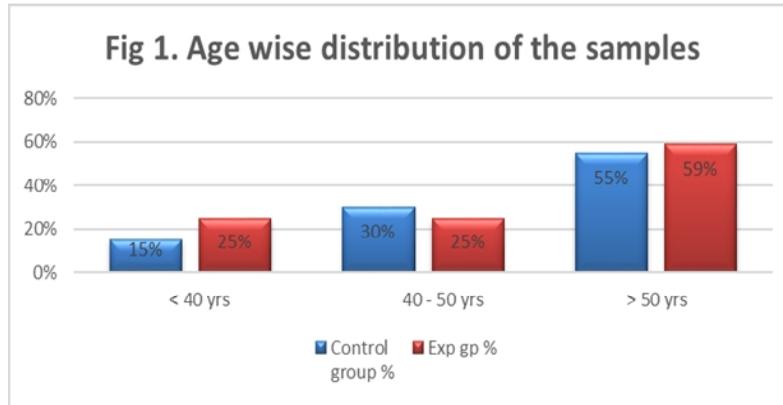
Parameter	Group	Mean ±SE	Significance paired t test		Significance unpaired t test	
			Exp pre & post test	Cont pre & post test	Exp & cont pre test	Exp & cont post test
Well being	Exp pre test	30.20±2.86	t = -1.852 NS	t = -0.963 NS	t = 1.3 NS	t = 6.14 P< 0.001
	Exp post test	55.55±4.25				
	Cont pre test	26.00±1.47				
	Cont post test	27.10±1.82				
Depression	Exp pre test	12.10±1.21	t = 5.746 P<0.001	t = 0.000 NS	t = -0.622 NS	t = -3.11 P<0.05
	Exp post test	8.60±0.91				
	Cont pre test	13.05±0.92				
	Cont post test	13.05±1.10				
QOL	Exp pre test	27.32±1.30	t = 15.681 P<0.001	t = 0.535 NS	t = 0.317 NS	t = 9.31 P<0.001
	Exp post test	43.37±1.44				
	Cont pre test	26.70±1.47				
	Cont post test	26.27±1.19				

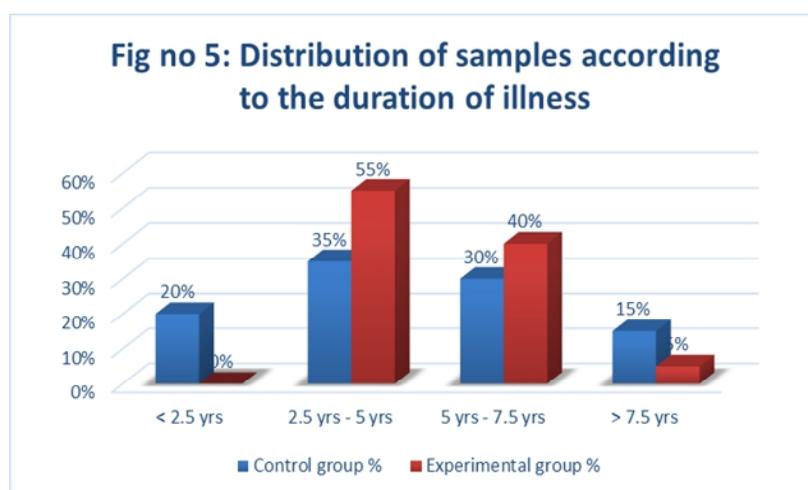
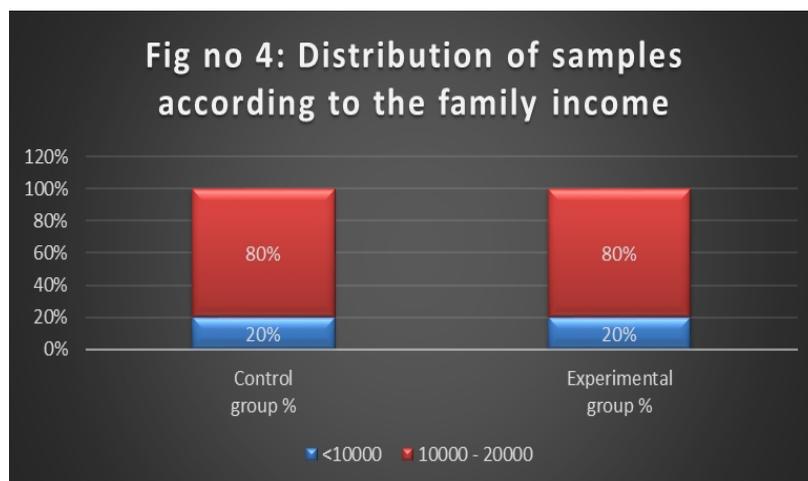
Table 3: Cost of treatment of samples before and after the intervention

Parameter	Group	Mean ±SE	Significance paired t test		Significance unpaired t test	
			Exp pre & post test	Cont pre & post test	Exp & cont pre test	Exp & cont post test
Direct cost	Exp pre test	1780.50±73.21	t = 2.587 P<0.05	t = 1.158 NS	t = 1.26 NS	t = 1.49 NS
	Exp post test	1649.50±67.98				
	Cont pre test	1946±107.85				
	Cont post test	1816±88.43				
Indirect cost	Exp pre test	3382.50±108.78	t = 9.649 P<0.001	t = 1.054 NS	t = 1.43 NS	t = 2.94 P<0.05
	Exp post test	2994±91.68				
	Cont pre test	3631±135.21				
	Cont post test	3951±311.23				

Table 4 Self-care measurements of samples before and after the intervention

Parameter	Group	Mean ±SE	Significance paired t test		Significance unpaired t test	
			Exp pre & post test	Cont pre & post test	Exp & cont pre test	Exp & cont post test
Self-Care	Exp pre test	32.90±2.56	t = 12.291 P< 0.001	t = -0.677 NS	t = 2.32 P<0.05	t = 3.01 P< 0.05
	Exp post test	58.20±2.76				
	Cont pre test	42.05±2.97				
	Cont post test	42.55±3.01				





It was observed that there is a significant difference in the physiological, psychosocial and economic parameters of diabetic clients in the experimental group before and after the intervention. There was a significant reduction found in PPBS, FBS, HbA1C, cholesterol and weight and BMI which were statistically significant between the pre and posttest of the experimental group. In control group there was difference noted in PPBS and FBS between pre and posttest. In pretest there was no difference between found between the control and experimental group but during the posttest there was a significant difference found in BMI, PPBS, and FBS.

The same method was used to calculate the change was in psychosocial parameters of both the groups before and after the intervention. There was a significant difference identified in depression, wellbeing and quality of life. There was a significant improvement in wellbeing and QOL whereas the depression was significantly reduced in the experimental group after the intervention.

CONCLUSION

Since there are more number of researches conducted on diabetes mellitus still it is a great challenge to the health care system and the family. It affects not only the individual but also the country as a whole. Any measure which controls diabetes, prevents complication, promotes the wellbeing, improves the quality of life and reduces the treatment cost is an efficient

intervention. Hence it can be concluded that self-management training is a cost effective intervention in managing diabetes mellitus.

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