

PILOT STUDY ON THE EFFECTIVENESS OF COGNITIVE BEHAVIOURAL NURSING INTERVENTION ON SELF EFFICACY, COMPLIANCE AND GLYCEMIC CONTROL AMONG PATIENTS WITH DIABETES MELLITUS

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ABSTRACT

Introduction

Diabetes mellitus has become a major chronic health problem throughout the world. To achieve good compliance patients need to participate actively in their self-management. Indeed lifestyle changes for diabetes patients can be facilitated by a combination of therapeutic interventions such as efforts to enhance awareness, behavior change and create the environment that supports good health practices. Hence the investigator tailored a cognitive behavioral nursing intervention to assess its effectiveness on self-efficacy, compliance and glycemic control among patients with diabetes mellitus.

Aim

The pilot study aimed at assessing the reliability and feasibility of the data collection and Cognitive behavioral nursing intervention tool and its effectiveness.

Material and Methods

A quantitative approach with experimental research design was adopted in this study. The samples were 40 patients with diabetes mellitus living in selected villages and having diabetes for more than 6 months. The research instruments used were self- efficacy rating scale, compliance scale and fasting and postprandial blood sugar levels assessed at pretest and after two months of intervention.

Results and Discussion

Comparison of post-test self-efficacy and compliance between experimental and control group patients showed a statically significant difference at $p < 0.0001$. Comparison of post-test fasting and postprandial blood sugar values between experimental and control group patients showed a statically significant difference at $p < 0.001$.

Conclusion

As conclusively evidenced in the collected data and results, a cognitive behavioral nursing intervention is fundamental and necessary to maintain the glycemic controls among patients with diabetes mellitus.

KEYWORDS: *Diabetes, Self Efficacy, Compliance and Glycemic Control*

INTRODUCTION

In recent years, non-communicable diseases (NCDs), such as cardiovascular diseases, diabetes, chronic obstructive pulmonary diseases (COPD) and cancers have become an emerging pandemic globally with disproportionately higher rates in developing countries¹. **The World Health Organization (WHO)** estimates that by 2020, NCDs will account for 80 percent of the global burden of disease, causing seven out of every 10 deaths in developing countries, about half of them premature deaths under the age of 70. According to WHO, it is estimated that the global NCD burden will increase by 17% in the next ten years. Almost half of all deaths in Asia are now attributable to NCDs, accounting for 47% of global burden of disease². Diabetes is increasing in epidemic proportions worldwide. Diabetes is a challenging disease to manage successfully. Although the care regimen is complex patients with good diabetes self-care can attain excellent glycolic control. However many patients do not achieve good glycemic control and continue to suffer health problems. This is especially important as the country is facing the challenges of growing number of patients with diabetes mellitus and provision of health services to these people has already become a challenge. Manjula GB, Premkumar.J³ (2015) concluded that the majority of subjects had average self-efficacy and self-care behaviour in domains of diet, exercise, blood sugar monitoring, medication and insulin administration and foot care. Mean HbA1c value was 8.87 ± 0.79 . A positive correlation was noted between self-efficacy and self-care behavior ($p < 0.001$). Also, increase in self-efficacy and self-care behavior was associated with a decrease in HbA1c values ($p < 0.001$).³ The study in Puducherry, southern India found only 49.3% of the diabetics had high medication adherence. Only 22.7% of the diabetics were involved in physical exercise for at least 30 minutes, for at least 4 days in a week. Only 16.7% of them regularly inspected their feet. Around 67.3% of the subjects reported about consuming a diabetic diet for at least 4 days/week. ⁴ Therefore, it is necessary to assess the compliance especially at the rural level where the awareness and knowledge of these diseases have been seen to be particularly low, which can then be acted upon to improve the compliance rate for a positive outcome.

OBJECTIVES

- To study the feasibility of Cognitive Behavioural Nursing Intervention on self-efficacy, compliance and glycemic control among patients with diabetes mellitus.

HYPOTHESIS

There is a significant difference in the self-efficacy, compliance and glycemic control among patients with diabetes mellitus who receive cognitive behavioral nursing interventions than who do not at $p < 0.05$ level.

METHODOLOGY

Quantitative approach with true experimental research design was adopted for this study. The study population consisted of patients with type-II diabetes mellitus, who are diagnosed to have diabetes mellitus and receiving treatment at selected Primary Health Centre. The independent variable for the study was cognitive behavioral nursing interventions and the dependent variable was self-efficacy, compliance, and glycemic control. A study was conducted in two villages in Kanchipuram District, Tamil Nadu. A total of 40 participants (20 in the experimental group and 20 in the control group) who satisfied the sample selection criteria were selected to participate in the study.

Description of the Data Collection Instrument

The tool will be prepared based on the objectives of the study. The data collection tool consists of

Part I: Demographic proforma for the diabetic patients. This section consists of age, gender, education level, living area, family monthly income, family type, religion, food pattern, occupation, etc

Part II: Diabetes-related variables such as duration of having diabetes mellitus; type of treatment receiving, Exposure to sources of information, health education received about diabetes mellitus, comorbid conditions, medication history etc and for women pregnancy and menstrual history was obtained.

Part III: Self-efficacy Rating scale to assess the self-efficacy of diabetic patients. It has 20 statements about various aspects of diabetes treatment to measure patients' confidence in following the treatment regimen. The maximum score a sample can receive was 60 and minimum score was 1.

Part IV: Compliance scale was used to measure the compliance of the diabetic patients.

Compliance scale measured patients' compliance to various aspects of diabetes self-care management. Maximum score a sample can obtain was 175 and minimum score was 0.

Data Collection Procedure

Identification of Subjects

Simple random sampling technique used to select the villages for control or experimental group. Based on the random selection of the villages, the number of samples available in a particular village selected. They were enrolled in either an experimental or control group based on the village they live. The investigator introduced self to the participants; the purpose of the study was explained to participants. Confidentiality was assured and written consent was obtained. To allay anxiety, samples will be constantly assured that there are no right or wrong answers and their replies will be kept confidential.

Place of Data Collection

Data collection was done at the respective samples residence.

First Step: The selected diabetic patients interviewed individually for baseline variables and consent obtained.

Second Step: Fasting blood sugar was checked and the structured rating scale administered by interviewing patients to determine self-efficacy and compliance. It took 30-40 minutes.

Third Step: Structured individualized cognitive behavioral nursing intervention was administered to the samples in the experimental group as per the plan of intervention. These included face to face individual education sessions and counseling for compliance

Fourth Step: The structured rating scale was administered by interviewing patients to determine post-test self- efficacy, compliance and glycemic controls after a month of interventions.

Fifth Step: Data analysis

Ethical Clearance: Before initiating the study, ethical approval and permission for the collection of data were

obtained. Informed consent was obtained from the subjects prior to the commencement of data collection from them.

Results: The content validity of the data collection tools was assessed by obtaining the expert opinion to ascertain Item-Content validity index and a sum of content validity index which is as follows:

Baseline Variables- I-CVI= 0.857; S-CVI= 0.977

Self-efficacy scale - I-CVI= 1.00; S-CVI= 1.00

Compliance scale- I-CVI= 0.94; S-CVI= 0.99

Reliability of the Tool

The Reliability of the tool was assessed through split half method and test –retest method. Reliability scores are as follows

Split Half: Self efficacy -0.96 Compliance scale- 0.93

Test- Retest Method: Self efficacy -0.965 Compliance scales- 0.90

These correlation coefficient values are very high and hence these tools are reliable enough for assessing the effectiveness of cognitive behavioral nursing intervention among patients with diabetes mellitus.

Section 1: Description of Background Variables

Section 1.1: Distribution of Demographic Variables of the Experimental and Control Group

Most of the study participants (70%) age was between 31- 50 years, were females, married, follows mixed dietary pattern, has no family history of diabetes mellitus, lives in nuclear family, completed primary school level of education, performs unskilled job, monthly income was 1601-4809/- in both experimental and control group.

Section 1.2: Distribution of Diabetes Related Variables of the Experimental and Control Group

Duration of the diabetes was 2-3 years, controls blood sugar with oral hypoglycemic agents, did not receive health education about diabetes mellitus, has comorbid conditions related to diabetes, has no habit of smoking, alcohol and tobacco chewing. Mean Waist-hip ratio in males were 0.93 and females were 0.88. Majority of patients were overweight.

Women only variables revealed that many of the women with diabetes had permanent method of birth control measures, attained menopause and has no plan to become pregnant.

Section 2: Assessment of Pretest and Posttest Self Efficacy, Compliance and Glycemic Control among Patients with Diabetes Mellitus in Both the Groups

Distribution of self-efficacy in control group patients showed that 19 (95%) had poor self-efficacy in both pre and post-test. During pre test 19 (95%) patients had poor self efficacy and 12 (60%) patients had fair self-efficacy during post-test in the experimental group. Assessment of compliance revealed that all patients 20 (100%) in control group had low compliance in both pre and post-test. Compliance score among patients in the experimental group showed that 18 (90%) of patients had low compliance in pre test and 4(20%) had moderate compliance in post-test. During this two months period, experimental group showed improvement in their self-efficacy and compliance score, but this kind of change was not noted in the control group.

Section 3: Effectiveness of Cognitive Behavioural Nursing Interventions on Self Efficacy, Compliance and Glycemic Control among Patients with Diabetes Mellitus

Table 3.1: Comparison of Pretest and Posttest Self Efficacy in Experimental and Control Group

Group	N	Pre Test Mean SD		Post Test Mean SD		Mean Difference	Paired 'T'
Experimental	20	25.6	5.06	39.0	5.56	5.40	't'= 1.22 P=0.238209. P<0.05 (NS)
Control	20	25.9	5.08	26.6	5.15	0.75	't'= 0.019 P=.98505 P<0.05 (NS)
Independent t test		t = 0.1871 p= 0.8526 (NS)		t = 7.3172 p< 0.001***			

Table 3.1 reveals that there is no significance difference in pretest and post test self-efficacy in both experimental and control group at p=0.05levels. Comparison of post-test self-efficacy between experimental and control group patients showed a statically significant difference at **p < 0.001**.

Table 3.2: Comparison of Pretest and Posttest Compliance in Experimental and Control Group

Group	N	Pre Test Mean SD		Post Test Mean SD		Mean Difference	Paired 'T'
Experimental	20	84.2	9.18	99.8	9.47	5.6	't'= 6.45 P= <0.001, P<0.05 (S)
Control	20	84.5	9.19	85.3	9.23	0.8	't'= 0.015 P=0.98819, P<0.05 (NS)
Independent t test		t = 0.1033 p= 0.9183		t = 4.9037 p= 0.0001***			

Table 3.2 reveals that there is a significance difference in pretest and post-test compliance in the experimental group at p=0.05 levels. Comparison of post-test compliance between experimental and control group patients showed a statically significant difference at **p< 0.0001**.

The pre-test score of the experimental and control group was similar, whereas the post-test score of the experimental group was significantly improved when compared to the control group, indicating that the administration of cognitive behavioral nursing intervention to the experimental group had a significant effect in improving self-efficacy and compliance among patients with diabetes mellitus.

Table 3.3: Comparison of Pre Test and Post Test Fasting Blood Sugar among Patients in Experimental and Control Group

Group	N	Pre Test Mean SD		Post Test Mean SD		Mean Difference
Experimental	20	146.8	12.11	142.5	11.93	4.3
Control	20	152.6	12.35	156.1	12.49	-3.5
Independent t test		t = 1.4996 p= 0.1420		t = 3.5213 p= 0.0011***		

Table 3.3: Comparison of post-test fasting blood sugar between experimental and control group patients showed a statically significant difference at **p= 0.0011**.

Table 3.4: Comparison of Pre Test and Post Test Post Prandial Blood Sugar among Patients in Experimental and Control Group

Group	N	Pre Test Mean SD		Post Test Mean SD		Mean Difference
Experimental	20	182.0	13.49	170.2	13.05	12.20
Control	20	180.2	13.04	182.7	13.14	2.50
Independent t test		t = 0.4290 p=0.6703		t = 3.0186 p= 0.0045 *		

Table 3.4: Comparison of post-test postprandial blood sugar between experimental and control group patients showed a statically significant difference at **p= 0.004**.

Results indicated that there was a marked reduction in the glycemic controls in the experimental group following the administration of cognitive behavioral nursing interventions.

DISCUSSIONS

The posttest scores revealed a significant difference between the groups due to the marked improvement in self- efficacy, compliance and glycemic controls in the experimental group, following the administration cognitive behavioral nursing interventions. The control group did not show much difference between the pre-test and post-test.

The main focus of this study was to test the reliability and feasibility of the data collection tools and cognitive behavioral nursing intervention and its acceptability and effectiveness in enhancing the self-efficacy thereby compliance and reduction in the glycemic controls.

The results indicated that assessment tools used, namely the self efficacy rating scale, compliance scale are highly reliable and appropriate for assessing the self-efficacy, compliance and glycemic controls along with cognitive behavioral nursing intervention. Further, the pilot study also indicated that the sampling technique based on the inclusion and exclusion criteria was appropriate for sample selection. The method of administering the cognitive behavioral nursing intervention, the teaching methods selected and the proposed analytical measures were suitable for the study. The comparison within and between the groups showed that there was a statistical significance indicating that the cognitive behavioral nursing intervention and the overall plan was effective, feasible and practicable to be applied in the main study

Strengths and Weakness of Pilot Study

Strengths

Home visits offered privacy and convenience

Home visits benefited both patients and family members

Volume of contents was manageable for each visits and permitted time for interaction (15-25 min for the main topic and later with counseling and review of earlier topics)

Difficulties

Difficulty in scheduling visits and maintaining standard teaching schedule

Exercise and dietary aspect was difficult to implement

Difficult to reach participants at home

CONCLUSIONS

This educational and counseling programme supplied necessary knowledge, and confidence to bring out behavioral modification so as to enable the patients for effective self-care management of their diabetes mellitus. As conclusively evidenced in the collected data and results, a cognitive behavioral nursing intervention is fundamental and necessary to maintain the glycemic controls among patients with diabetes mellitus.

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