

Type 2 Diabetic Patient-Centered Care

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Background : The prevalence of diabetes mellitus has increased worldwide including Thailand. Management of diabetes should be considered biological and psychosocial. Patient-centered care was applied in the present study. Patient-centered care is a process interaction between the clinician and the patient. It refers to the clinician's behavioral skill in the consultation. Patient-centered care customizes seeking and accepting the patient's ideas, seeking and giving recognition and encouragement, treatment recognition and decision making in response to the individual patient's perspective.

Objective : To evaluate the efficacy of patient-centered care on type 2 diabetes mellitus. Their fasting plasma glucose (FPG), hemoglobin A1c (HbA1c), eating and exercise behavior, compliance, symptoms of diabetes as well as satisfaction were compared before and after the intervention.

Material and Method : The quasi-experimental design (controlled before and after intervention) was conducted among 78 patients with type 2 diabetes mellitus who regularly attended the outpatient clinic, Family Medicine Department, whose FPG was more than 150 mg/dL, non pregnant, could communicate well in Thai and had no other complications. The patients were required to follow on Wednesday morning every 6-10 weeks for one year. A group of 6-10 patients was appointed in each visit. The six interconnecting components of patient-centered care were applied. (1) The patients and the researchers were introduced to each other to enhance the relationship between the patients, doctors and researchers. (2) In each visit, by using a group process and individual approach, the authors explored, assessed and analyzed both the disease, the illness (patient's ideas, feelings, expectations and functions), drug compliance, eating and exercise behavior. (3) The patient's life, family history, psychological and social behaviors were emphasized. (4) Setting the goals of FPG level that is achievable and agreeable to both the physician and patients, (5) Each patient was required to attend both nutrition and exercise education workshops. (6) Self care and self records on food items as well as nutrition and exercise practice were emphasized in order to incorporate them into their lifestyle.

Results : There were 53 females (67.9%) and 25 males (32.1%). Average age was 57.2 years. Diabetes duration was 6.75 ± 5.45 years. Mean FPG of overall subjects decreased 43.07 ± 76.32 mg/dL. About 16.44% had FPG below 126 mg/dL. 55.13% retained the same hypoglycemic medications, 10.5% had decreased dosage. Amongst 33 subjects (42.3%) who completed the program, FPG decreased 73.58 ± 70.99 mg/dL ($p < 0.000$). HbA1c decreased $0.92 \pm 1.41\%$ ($p = 0.001$). Eating behavior ($p < 0.000$) and exercise behavior ($p < 0.05$) were better. Symptoms of diabetes were improved. Patient's satisfaction indicated that they had a better understanding of the disease and illness. They were eager to share their experiences with others and able to develop a relationship with the health care team. Amongst 45 patients (57.7%) who partially followed the program, FPG decreased 39.55 ± 68.54 mg/dL ($p = 0.001$).

Conclusion : Glycemic control of type 2 diabetes subjects was improved by patient-centered care, Eating and exercise behaviors, compliance, symptoms of diabetes were better. This pilot study showed that the health status was improved not only by the biological indicators but also by behavior. The present study provided a beneficial impact on improving the health status of type 2 diabetes.

Keywords : Type 2 diabetes, Care, Patient-centered

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Diabetes mellitus can be found in almost every population in the world and continues to increase globally⁽¹⁾. It has been estimated that between 1995 and 2025 there will be a 35% increase (from 4.0 to 5.4%) in the worldwide prevalence of diabetes and 170% increase (from 84 to 228 million) in developing countries⁽²⁾. In Thailand, the prevalence increased from 33.3 to 147.2 per 100,000 population between 1985 and 1997⁽³⁾. Most of the diabetes (95.0-96.3%) was type 2⁽⁴⁾. In 1998, it was estimated that 1,380,000 people will be diagnosed with diabetes (2.3% of the population affected)⁽⁵⁾. Most of them were women. The risk of developing diabetes increases with age with a sharp rise above forty years⁽⁶⁾. The prevalence (age-adjusted rate) of diabetes was 5-7% in the population aged 30-64 years⁽⁷⁾ and 10-15% aged over 60 years old⁽⁶⁾. In the year 2000, the majority of diabetes cases in the outpatient clinic, Department of Family Medicine, Ramathibodi Hospital were type 2. Sixty six percent of them had blood sugar levels above 140 mg/dL. Inadequate blood sugar control may be influenced by psychological and social factors⁽⁷⁾. Engel G.L. gave an interesting explanation about the system theory as a basis for understanding human sickness. A patient is composed of systems (tissue, cells, molecules) which are part of several larger systems (dyads, family, communities). The biological factor alone cannot be cured. This model reminds us to consider personal and social dimensions of illness, in addition to biological variables⁽⁸⁾. Therefore, we should consider not only the biological abnormalities, but also the personal and social make up in diabetes management. The concept of patient-centered care which is attributed to the work of Michael Balint et al, Levenstein and the University of Western Ontario⁽⁹⁾ is consistent with that mentioned above. Patient-centered care is a process of interaction between the clinician and the patient. It refers to the clinician's behavioral skill in the consultation. Patient-centered care customizes seeking and accepting the patient's ideas, seeking and giving recognition and encouragement, treatment recommendations and decision making in response to an individual patient's perspective.

Objective

To evaluate the efficacy of patient-centered clinical care on type 2 diabetes. Fasting plasma glucose (FPG), hemoglobin A1c (HbA1c), eating and exercise behavior, compliance, symptoms of diabetes (polyuria, polydipsia, polyphagia, weakness, numbness and blurred vision) as well as satisfaction were compared before and after the intervention.

Material and Method

The one full year pilot quasi experimental design (controlled before and after intervention) was conducted on Wednesday mornings. Patients with type 2 diabetes, regularly attended the outpatient clinic of the Family Medicine Department, Ramathibodi Hospital, Mahidol University. The enrolled patients were required to have the following criterias. (1) Fasting plasma glucose more than 150 mg/dL. (2) Non pregnant. (3) Could communicate well (reading, writing, listening) in Thai. (4) Without cardiovascular, neurological, and renal complications. (5) Follow up every 6-8 weeks. A group of 6-10 patients was allotted for each visit. The six interconnecting components of patient-centered care⁽⁹⁾ were applied.

(a) The patients and the researchers were introduced to each other to establish the patient-patient, patient-doctor, and patient-healthcare team relationship.

(b) At each visit, by using the group process and individual approach, the researchers explored, assessed and analyzed the situation. These included the nature of diabetes (symptoms of hypoglycemia/hyperglycemia, complications, and its management), other concomitant diseases, illness (patient's ideas, feelings, expectation and function), drug compliance, eating and exercise behavior. Subjects participated by group process at every visit. Individual process was also emphasized especially at the first visit and whenever problems arose such as uncontrolled FPG level, and psychosocial problems.

(c) Psychological and social behaviors were emphasized. Counseling and management were given where necessary.

(d) Goal of FPG level of each patient was adjusted by each individual patient and the team. The goal of FPG level of the following visit must be lower than the present visit. A Hypoglycemic drug was added or changed if the 3 consecutive FPG levels had not decreased from the previous value. Before adding or changing medication, the patient had to follow non pharmacological management conditions such as drug compliance, diet and exercise which were assessed by depth interviews.

(e) Each patient had to attend both nutrition and exercise education workshops. The nutrition workshop (2 hours) was guided by the hospital nutritionist and the study team. The patient's family members were invited. The workshop focused on the basics of food groups, the difference between simple and complex carbohydrates, sources of protein, fruit and vegetables containing fiber, soft drinks and

beverages. Nutrition content was demonstrated by using food models, healthier food substitutes and exchange of food items such as calories in one scoop of rice being equivalent to one banana. Nutrition was put into practice by a luncheon workshop (1 hour). Immediate evaluation was completed after lunch.

Exercise workshops (1 hours) were taught and conducted by specialist physicians (physical therapist) and the team. The content consisted of basic knowledge of exercise, various kinds of daily activities, walking and its benefit. The patients were encouraged to exercise during their daily activities or walk 30 minutes per day, 4 times a week.

(f) Each patient had to take notes and self record food diaries two days per week. Self-care as well as nutritional and exercise assessment and suggestions were included in every appointment in order to incorporate their lifestyle.

The demographic characteristics, FPG, HbA1c, lipid profile, eating and exercise behaviors, symptoms of diabetes (polyurea, polydipsea, polyphagia, weakness, numbness and blurred vision), usage of hypoglycemic drugs, and satisfaction were analyzed before and after intervention.

Based on previous data⁽¹⁰⁾ (mean % HbA1c was 9.63 ± 2.26), the calculated minimum total sample size of 78 patients was needed in order to detect (with a two tailed significance level of 5%) a 0.5 error of means. Analysis was based on intention to treat. Health mea-

surement was performed by using percentage, rating scales, pair *t*-test, 95% confidence interval (CI), *p*-value and qualitative expression.

Results

The subjects' overall baseline demographic characteristics are listed in Table 1. There were 68% female and 32% male. The average age was 57.2 years old. Mean dia-betes duration was 6.75 ± 5.45 years. Fifty nine percent had only diabetes. The other 41% had diabetes con-current with other diseases such as hypertension and/or dyslipidemia. Mean FPG was decreased 43.07 ± 76.32 mg/dL significantly ($p < 0.000$) with a 95% confidence interval of difference between 25.26 to 60.87 mg/dL. There were 55.13% who retained the same hypoglycemic medications, 10.5% decreased dosage, 25.6% increased dosage and/or added more drugs and 5.1% changed medications. Table 2 shows that 16.44% (12 from 73 cases) had FPG below 126 mg/dL. There were 9 subjects in the completed group and 3 subjects in the partially followed group.

Of the 78 type 2 diabetic subjects, 33 (42.30%) subjects completed the program. The average frequency of visiting the program was 8 times at the one year measurement point. The diabetes duration of the completed group was 8.52 ± 5.61 years (Table 1). Mean FPG decreased 73.58 ± 70.99 mg/dL ($p < 0.000$) with the 95% conference interval of difference between 48.40 to 98.75 mg/dL (Table 2). The HbA1c decreased

Table 1. Subjects' demographic characteristics

		No.of complete follow up		%		No of partial follow up		%		Total		%	
Sex (N=78)	Female	28		84.8		25		55.6		53		67.95	
	Male	5		15.2		20		44.4		25		32.05	
Age (years)	45-50	6		18.2		10		22.2		16		20.51	
	51-60	13		39.4		17		37.8		30		38.46	
	> 60	14		42.4		18		40.0		32		41.03	
	Mean SD	58.6	7.5			56.22	9.68			57.24	8.86		
Diagnosis	DM	16		48.5		30		66.6		46		58.97	
	DM & hypertension (HT)	14		42.4		10		22.2		24		30.77	
	DM & dyslipidemia	2		6.1		4		8.9		6		7.69	
	DM & HT & dyslipidemia	1		3.0		1		2.2		2		2.57	
Duration of known DM	<5 years	12		36.4		28		62.2		40		51.28	
	5-10 years	11		33.3		13		28.9		24		30.77	
	> 11 years	10		30.3		4		8.9		14		17.95	
	Mean SD	8.52	5.61			5.47	5.01			6.75	5.45		
Hypoglycemic drugs at the study end	Same dosage & regimen	20		60.6		23		51.1		43		55.13	
	Decrease dosage	7		21.2		1		2.2		8		10.26	
	Increase dosage or add more drug	6		18.2		14		31.1		20		25.64	
	Change dosage & regimen	-		-		4		8.9		4		5.13	
	Unkown	-		-		3		6.7		3		3.84	

Table 2. Number of subjects and percentage according to FPG at various levels , FPG mean, 95% CI and differences of mean (p-value) before and after intervention

FPG (mg/dL)	No. of complete follow up subjects (%)						Mean	SD	95% CI	P-value
	<126	126-140	141-160	161-180	181-200	>201				
Before (N=33)	0	0	2 (6.1)	6 (18.2)	6 (18.2)	19 (57.6)	226.09	71.29	48.40-98.75	0.000
After (N=33)	9 (27.3)	6 (18.2)	7 (21.2)	5 (15.2)	1 (3.0)	5 (15.2)	152.52	48.35		

FPG (mg/dL)	No. of partial follow up subjects (%)						Mean	SD	95% CI	P-value
	<126	126-140	141-160	161-180	181-200	>201				
Before(N=40)	0	0	3 (6.7)	9 (14.3)	10 (22.2)	23 (51.1)	214.25	51.94	17.63-61.47	0.001
After(N=40)	3 (6.7)	8 (17.8)	12 (26.7)	3 (6.7)	4 (8.9)	10 (22.2)	174.70	55.04		

Table 3. Number of complete follow up subjects and percentage according to HbA1c at various levels, mean HbA1c, 95% CI and the differences of mean (p-value) before and after intervention (N=31)

HbA1c (%)	No. of subjects (%)				Mean	SD	95% CI	P-value
	<7	7-8	9-10	11				
Before	1 (3.2)	16 (51.6)	11 (35.5)	3 (9.7)	9.07	1.48	0.39-1.43	0.001
After	1 (3.1)	26 (81.3)	4 (12.5)	1 (3.1)	8.15	1.14		

Table 4. Number of complete follow up subjects and the percentage according to each variable which is indicated by the rating scale (0, 1-2, 3-4, and 5 times/day, scoops/meal, or times/week), mean of rating scale and difference of mean (P-value) before and after intervention (N=33)

Variables	No. of complete follow up patients (%)				Mean	SD	P-value
	0	1-2	3-4	5			
Number of meals (times/day)							
Before	0	3 (9.1)	23 (69.7)	7 (21.2)	3.55	0.94	< 0.000
After	0	9 (27.3)	23 (69.7)	1 (3.0)	2.79	0.60	
Amount of rice (scoops/meal)							
Before	0	19 (57.6)	11 (33.3)	3 (9.1)	2.65	1.2	<0.000
After	0	29 (87.9)	4 (12.1)	0	1.74	0.65	
Number of soft drinks (times/day)							
Before	10 (30.3)	12 (36.3)	1 (3.0)	10 (30.3)	2.00	2.11	<0.000
After	24 (72.7)	8 (24.2)	0	1 (3.0)	0.42	0.97	
Amount of fruit (times/day)							
Before	5 (15.2)	4 (12.1)	13 (39.4)	11 (33.3)	3.03	1.79	<0.000
After	11 (33.3)	15 (45.4)	6 (18.2)	1 (3.0)	1.39	1.34	
Amount of dessert (times/day)							
Before	12 (36.4)	6 (18.2)	7 (21.2)	8 (24.2)	2.15	2.03	<0.000
After	23 (69.7)	9 (27.3)	0	1 (3.0)	0.48	1.0	
Exercise (times/week)							
Before	14 (42.4)	7 (21.2)	12 (36.4)	0	1.42	1.37	<0.021
After	7 (21.2)	7 (21.2)	19 (57.6)	0	2.09	1.23	

Table 5. Number of complete follow up subjects, percentage according to nocturia before and after intervention (N=33)

Nocturia (times/night)	No. of subjects (%)						Mean	SD	P-value	
	0	1	2	3	4	5				6
Before	3 (9.1)	7 (21.2)	11 (33.3)	8 (24.2)	3 (9.1)	0	1 (3.0)	2.15	1.30	0.044
After	7 (21.2)	7 (21.2)	13 (39.4)	3 (9.1)	2 (6.1)	1 (3.0)	0	1.67	1.27	

Table 6. Number of the complete follow up subjects, percentage corresponding to diabetic symptoms indicated by absence of symptoms (N=33).

Symptoms	No. of absent of symptoms (%)	
	Before	After
Polydipsia	8 (24.2)	23 (69.7)
Numbness	18 (54.5)	26 (78.8)
Weakness	12 (36.4)	29 (87.9)
Polyphagia	13 (39.4)	29 (87.9)
Blur vision	17 (51.1)	24 (72.7)

0.92 ± 1.41% ($p < 0.001$) with the confidence interval of difference between 0.39 to 1.43% (Table 3). There was 27.27% (9 subjects) who had FPG less than 126 mg/dL where 5 subjects received the same medications and 4 subjects decreased the dosage.

Of 45 subjects (57.7%) partially followed the program because they were unable to handle the schedule. The standard medical care was maintained by their physicians. The average frequency of visiting the program was 4.7 times at the one year measurement point. Diabetic duration was 5.47 ± 5.01 years (Table 1). Table 2 shows that the mean FPG of 40 subjects decreased 39.55 ± 68.54 mg/dL significantly ($p < 0.01$) with a 95% confidence interval of difference between 17.63 to 61.47 mg/dL. The other 5 subjects went to another hospital because of the reimbursement system. There was 7.5% (3 subjects) with FPG less than 126 mg/dL where 1 subject received the same regimen, 1 subject decreased the dosage and 1 subject changed their drug regimen.

Patients' behaviors of the completed program group changed significantly as shown in Table 4. The average number of meals/day was reduced from 3.55 ± 0.94 to 2.79 ± 0.60. The amount of rice intake also decreased from 2.65 ± 1.2 to 1.74 ± 0.65 scoops/meal. Exercise improved with statistical significance ($p < 0.05$). The additional symptoms such as nocturia, polydipsia, numbness, weakness, polyphagia, and blurred vision improved significantly (Table 5,6). Table 7 shows that the lipid profile and body weight were improved.

After one year, the complete follow up group indicated that they had a better understanding of their diabetes and illness. Self-care process had improved. The subjects were willing to share their experiences with others and able to develop a relationship with the health-care team. Thus, through the present study, the subjects were satisfied with their overall experiences.

Discussion

Subjects' baseline demographic characteristics were similar to the data collected in Thailand by Diabcare Asia Project⁽¹¹⁾. The baseline characteristics of 33 subjects (42.30%) who completed the program (average 8 visits) did not differ from those partial follow up (average 4.7 visits) except the duration of known diabetes. The completed group had an approximate duration of known diabetes 3 years more than the partial followed group significantly. This suggests that subjects who had a longer duration of diabetes (more than 5 years), were more likely to complete the program.

Glycemic control as recommended by clinical practice guideline⁽¹²⁾ must be a major goal of any management strategy developed for diabetic patients. Many interventions⁽¹³⁻¹⁹⁾ have documented the beneficial effects on glycemic control such as readiness to change before participating in diabetic education intervention⁽¹³⁾, integrated intensive diabetic education program⁽¹⁴⁾, diabetes self-management record coupled with a diabetes education program⁽¹⁵⁾, education program alone⁽¹⁶⁾, continuing care with a primary care provider⁽¹⁷⁾ and community based nutrition and exercise intervention⁽¹⁸⁾.

This patient-centered care emphasized 6 interconnecting components rather than 1 or 2 components compared to the previous studies. It was conducted by primary care providers in a university hospital setting. Promptness to change of subjects before the participation might have an effect on the achievement. The 12-month (1 year) study period was

Table 7. Comparison of the lipid profile and the body weight of complete follow up patients before and after the intervention

Variables	Mean		SD		t	95% CI	P-value
	Before	After	Before	After			
Cholesterol (mg/dL)	219.17	40.14	218.73	43.99	0.068	(-)12.58 - 13.45	0.946
Triglyceride (mg/dL)	177.90	113.02	159.97	76.41	1.414	(-)8.0 - 43.86	0.168
HDL-Cholesterol (mg/dL)	45.9	8.36	49.80	11.73	2.496	(-)7.10 - (-)0.7	0.019
LDL-Cholesterol (mg/dL)	141.97	39.55	138.43	41.77	0.575	(-)9.03 - 16.1	0.57
Body weight (kg)	63.13	9.29	62.29	9.75	1.94	(-)0.04 - 1.74	0.061

long enough to establish a patient-healthcare team relationship. It allowed the team to continually follow the subjects' progression, and observe changes both quantitative and qualitative.

Healths indicator such as FPG decreased significantly in both the complete and partial follow up group. There was no significant different between the complete and partial follow up group. Patient-centered care intervention shows an increasing percentage (16.44%) of subjects whose FPG level was below 126 mg/dL as re-recommended by the guideline⁽¹²⁾. There were more subjects in the complete follow up group than in the partial follow up group (9 and 3 subjects). Retaining and decreasing of hypoglycemic medications was greater in the complete studied group. It is suggested that there is a likelihood of better glycemic control among subjects who completed the program. The other health indicators such as HbA1c, body weight, lipid profile, eating and exercise behaviors, and symptoms of diabetes of the completed program group also improved.

The intervention allowed the team to evaluate biopsychosocial conditions of the patients and make appropriate recommendations. The process helped the subjects to identify goals to control diabetes. The subjects were then able to commit a step-by-step progression in order to reduce blood sugar via diet, exercise and medication. The method initiated group therapy in order to share ideas and experiences among the subjects themselves with guidance from the intervention team. The subjects were able to discuss their own problems with their peers as well as receive support. It also made the visit to the hospital more enjoyable because they got to meet more people and were able to make more friends who shared the same or similar experiences. The subjects responsibilities to self care was improved as shown by changing behavior of their diet, exercise, taking of medications and avoidance of stressful situations. There were 45 subjects (57.7%) who followed the program partially. The subjects were unable to arrange their schedule following the program because the authors organized it for only one half day per week. When subjects missed the appointment of the program they were cared by another physician who was available 5 days per week.

Conclusion

Glycemic control of type 2 diabetes subjects were improved by patient-centered care, Eating and exercise behaviors, compliance, symptoms of diabetes were better. This pilot study shows that the health status was improved not only by biological indicators

but also by behavior. The present study provides a beneficial impact by improving the health status of type 2 diabetes.

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การดูแลผู้ป่วยเบาหวานโดยผู้ป่วยเป็นศูนย์กลาง

สมจิต พุกษะรัตนานนท์, สายสุนีย์ ทับทิมเทศ, กรทอง อัครวานิชย์, วาสุณี เตียวทรานนท์

บทนำ : ปัจจุบันเบาหวานมีแนวโน้มเพิ่มมากขึ้น การดูแลผู้ป่วยเบาหวานควรได้รับการดูแลทั้งทางโรคจิตวิทยาและสังคม การวิจัยนี้จึงใช้แนวคิด “การดูแลโดยผู้ป่วยเป็นศูนย์กลาง” ซึ่งเป็นกระบวนการการดูแลที่ประกอบด้วยทักษะ 6 องค์ประกอบผสมผสานเพื่อการดูแลผู้ป่วยเบาหวานชนิดไม่พึ่งอินซูลิน

วัตถุประสงค์ : เพื่อเปรียบเทียบระดับน้ำตาลในเลือด พฤติกรรมการรับประทานยาและอาหาร การออกกำลังกาย และอาการของโรค เบาหวาน (เช่น ปัสสาวะบ่อย ดื่มน้ำบ่อย อ่อนเพลีย ชาปลายมือ ปลายเท้า) และความพึงพอใจก่อนและหลังดำเนินการ

วิธีการ : การศึกษานี้เป็นการวิจัยกึ่งทดลองแบบกลุ่มเดียวใช้วิธีเปรียบเทียบก่อน และหลังการทดลองในผู้ป่วยเบาหวานชนิดไม่พึ่งอินซูลินที่ระดับน้ำตาลในเลือดขณะอดอาหารมากกว่า 150 มก./ดล. จำนวน 78 ราย ซึ่งติดตามการรักษาอย่างต่อเนื่องในเช้าวันพุธทุก 6-10 สัปดาห์เป็นเวลา 1 ปีเต็มโดยประยุกต์ “การดูแลโดยผู้ป่วย เป็นศูนย์กลาง” ซึ่งประกอบด้วย ความเชื่อมโยง 6 ประการ มาใช้ ได้แก่ 1) การสร้างสัมพันธ์ภาพระหว่างผู้ป่วย และทีมผู้ให้บริการ 2) ทำความเข้าใจทั้งด้านโรค และความเจ็บป่วย 3) เข้าใจผู้ป่วย ครอบครัว สภาวะทางจิต และอารมณ์ 4) กำหนดเป้าหมายการรักษาร่วมกัน 5) การให้แนวทางด้านการป้องกันโรคแทรกซ้อน และการส่งเสริม สุขภาพ เช่น การให้ความรู้ และจัดประชุมเชิงปฏิบัติการด้านโภชนาการ และการออกกำลังกาย 6) กระตุ้นผู้ป่วยให้รับผิดชอบดูแลตนเองโดยสอดคล้องกับวิถีชีวิต

ผลการศึกษา : ผู้ป่วย 78 ราย ส่วนใหญ่เป็นเพศหญิง (67.9%) มีอายุเฉลี่ย 57.2 ปี เป็นเบาหวานเฉลี่ย 6.75 ± 5.45 ปี มีระดับน้ำตาลในเลือดลดลงเฉลี่ย 43.07 ± 76.32 มก./ดล. มีผู้ป่วยที่ระดับน้ำตาลในเลือดน้อยกว่า 126 มก./ดล. จำนวน 16.44% ผู้ป่วยที่กินยาขนาดเท่าเดิม 55.13% ได้รับขนาดยาลดลง 10.5%

ในกลุ่มผู้ป่วยที่เข้าโครงการครบ 1 ปี มีจำนวน 33 ราย (42.3%) ระดับน้ำตาลในเลือดเฉลี่ยภายหลังดำเนินการดีกวาก่อนดำเนินการโดยลดลง 73.58 ± 70.99 มก./ดล. ($p < 0.000$) และ HbA1c ลดลง $0.92 \pm 1.41\%$ อย่างมีนัยสำคัญทางสถิติ ($p = 0.001$) พฤติกรรมการรับประทานยา และอาหารภายหลังดำเนินการดีวก่อนดำเนินการอย่างมีนัยสำคัญทางสถิติ ($p = 0.01$) พฤติกรรมการออกกำลังกายก่อน และหลังดำเนินการลดลงแตกต่างกันตามค่าทางสถิติ ($p < 0.05$) อาการของ โรคเบาหวานภายหลังดำเนินการดีขึ้น มีผู้ป่วยที่เข้าโครงการไม่ครบ 1 ปี จำนวน 45 ราย (57.7%) เนื่องจากมาไม่ตรงวันพุธ ระดับน้ำตาลในเลือดลดลง 39.55 ± 68.54 มก./ดล.อย่างมีนัยสำคัญทางสถิติ ($p = 0.001$)

สรุป : การประยุกต์วิธีการดูแลโดยผู้ป่วยเป็นศูนย์กลาง ทำให้ค่าเฉลี่ยของระดับน้ำตาลในเลือดลดลง ผู้ป่วยมีพฤติกรรมการรับประทานยา และอาหารดีขึ้น อาการของโรคเบาหวานลดลง และยังส่งเสริมให้ผู้ป่วยเข้าใจโรคและความเจ็บป่วยของตนเอง ผู้ป่วย 42.3% ที่เข้าโครงการครบพึงพอใจการดูแลโดยวิธีนี้ ดังนั้นวิธีการดูแลผู้ป่วยเป็นศูนย์กลางมีประโยชน์ในการดูแลผู้ป่วยเบาหวาน ชนิดไม่พึ่งอินซูลิน
