

Evaluation of a Quality Improvement Program Implementation on Diabetic Care Satisfaction and Utilization in Academic Family Practice Center, Ismailia, Egypt

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ABSTRACT---- *Introduction: Quality in health defined as providing client-centered services and meeting clients' needs. Assessment of patient satisfaction has been used as a measure of service outcome. Providers in all settings frequently do not meet diabetes quality-of-care standards as outlined by most Diabetes care guidelines. Suboptimal care found in academic medical centers, and private doctors' offices. Aim of the study: The aim of study is to improve diabetic care and patient satisfaction. Methodology: a quasi-experimental design used at an academic rural family medicine center affiliated to Suez Canal University hospital. It involved (105) type 2 diabetic adult patients selected through systematic random sampling from attending patient and 75 discontinuors interviewed through home visits. Results: The main reasons for dissatisfaction were deficient health education on foot care, high cost, and lack of appointment system. The percentage of satisfied patients was significantly higher in the post-intervention sample ($p < 0.001$). In total, 41 (39.0%) patients were dissatisfied with the service pre-intervention, compared to only 1 (1.0%) patient post-intervention ($p < 0.001$). Multivariate analysis revealed that the intervention was a positive predictor of the satisfaction scores. Conclusion: implementation of intervention programs based on client needs assessment improves the quality of diabetic care outcomes and service utilization.*

Keywords— Quality, Quality Improvement, diabetes care, patient satisfaction.

1. INTRODUCTION

In recent years, there has been greater attention paid to the quality of health care [1]. It becomes an issue of increasing interest and concern among physicians and health care managers [2]. “Meeting customer’s need and expectations” is another useful definition for quality. Well-designed services create customer satisfaction because they provide the features or characteristics that customer’s need [3]. The better the organization meets customer needs by providing the right combination of desirable features, the higher its revenue is likely to be [4]. Patient satisfaction surveys are a favorite tool of quality improvement professionals, especially teams interested in the perceptions of patients, either in terms of the quality of care or the quality of service provided [5].

Decades ago, pioneers such as John Runyon recognized that the effective management of chronic illness Requires a new kind of practice designed expressly to help patients meet the challenges of chronic disease. More Recently, stronger evidence suggests that busy practices can redesign their care and do much better than “care as Usual.” For example, a recent Cochrane Collaboration review carefully examined the more rigorously tested Interventions to improve primary care for diabetes. Among the forty-one studies examined, many showed increases in recommended care processes such as the prevalence of eye or foot examinations and a few improved health and Disease-control outcomes [6].

2. METHODOLOGY

- **Setting of the study:** the study conducted at an academic rural family medicine center affiliated to department of family medicine, Suez Canal university Hospital, providing care to diabetic patients in the catchment area of rural Ismailia, Egypt.
- **Study design:** a quasi-experimental design used.
- **Preparation phase:** This phase involved setting the stage for the QI program. The following activities done: The QI team formed from the researcher, one doctor, one nurse, two registration employees, and one health worker.

Formation of the community quality team: members chosen according to the following criteria: Live in the same village, good communication skills, interested in quality activities, able to conduct interviews.

- **Assessment phase include** assessment of diabetic patient continuous users satisfaction, and discontinuers points of dissatisfaction. Both questionnaire results prioritized using Pareto.

Studied population:

- **Inclusion criteria:** Any patient diagnosed with type 2 diabetes in the area of the study was eligible for inclusion criteria: Adult (18 years or older), Diagnosed as diabetic for more than one year.

A list was prepared, then divided into two strata according to the continuity of service utilization: 1) Patients who stopped utilization of diabetes care for one year reached through home visits. 2) Patients who are regularly utilizing diabetes services at the center, a minimum of two visits during the last 12 months.

Exclusion criteria: diabetic not receiving their usual care from the family practice center, private sector or hospital.

Two sample sizes estimated:

- **Sample size for the causes of satisfaction:** The sample size estimated to detect cause of discontinuation among those who discontinued with a rate of 20% or higher, compared to 5% or less among those who continue utilization, with a proportionate allocation of the discontinued to the continued (0.65:1.00). Using the sample size equation for the difference between two proportions (Epi-Info 6.04) with a 95% level of confidence (α error = 5%), and a study power of 80% (β error=20%) the sizes for the discontinued and continued groups were 70 and 105 patients, respectively, diabetic adult patients that were selected through systematic random sampling.
- **Data collection tool:**
- Data collected by a semi-structured interview questionnaire (*Stephen (2003)*). The items' responses were on a 5-point scale: highly satisfied, satisfied, average, dissatisfied, and highly dissatisfied. The items scored 5,4,3,2 and 1 respectively. For each area, the scores of the items were summed-up and the total divided by the number of the items, giving a mean score for the part. These scores were converted into a percent score with mean and standard deviations computed. A higher score indicated more satisfaction. The subject was considered satisfied if the score percent was 60% or more and dissatisfied if less than 60%.

Quality tools:

Flowchart: This was done to describe patient flow in the center to determine the bottlenecks. The chart showed that there is delay during waiting for consultation or investigations.

Brainstorming sessions: held to discuss possible causes of dissatisfaction from the point of view of the health care team.

Fish bone diagram: This organized ideas resulting from brainstorming by the health team. Regard **people**, poor compliance, poverty, illiteracy and prefer diabetes specialist. Meanwhile, **providers'** low commitment, poor communications and lack of adherence to guidelines were mentioned. The uncomfortable, overcrowded waiting area, lack of privacy was mentioned. There is deficiency in structures such as equipment, dipstick urine strips, and health education materials. In the **process** of diabetic care, absence of follow-up system, poor appointment system, long waiting time, and inadequate staff training mentioned. Regarding **policy**, absence of free drugs & health insurance, and ineffective referral system cited.

Priority matrix: prioritizing solutions used according to set criteria by the team. These included the **time** to implement the activity, **cost** to implement the activity, **effectiveness for decreasing pt dissatisfaction**, and **feasibility** to implement it. These criteria were rated from 1 to 3, and the actions with the highest score were chosen.

- **Action plan:** An action plan form used. The priority actions include dealing with SCUH (Suez canal university hospital) for drug supply and performing annual investigations discounted for continues users, treatment at the

expense of the state, setting an appointment system for long waiting time, tailoring health education messages directed to patient needs specially foot care.

3. DATA MANAGEMENT

The measures of the processes of care expressed as a ratio of the actual practice divided by the best practice as defined by the quality team. As the quality measure, expressed as a ratio, approaches the value of 1, the quality of care approaches the best practice. Thus, the referent for the evaluation of process of care is normative.

- Data entry and statistical analysis were done using SPSS 14.0 statistical software package. Data was presented using descriptive statistics as frequencies and percentages for qualitative variables, means and standard deviations for quantitative variables. Quantitative continuous data were compared using Student t-test in case of normal distribution, or non-parametric Mann-Whitney test. Qualitative categorical variables were compared using chi-square test or Fisher exact test as suitable. To identify independent predictors of satisfaction, multiple linear regression analysis was used. Statistical significance was set at p-value <0.05.
- **Ethical considerations:** the study was approved by the ethical committee of faculty of medicine, Suez Canal University, and has been performed in accordance with the ethical standards laid down in the declaration of Helsinki (1964). Questionnaires were anonymous did not contain any critical questions, and confidentiality of the data were maintained.

4. RESULTS

Table 1 point to statistically significant differences in the socio-demographic characteristics between continuous and discontinuers of diabetic service utilization. It is clear that the discontinued group included higher percentages of older age (p=0.008), males (p=0.01), married (p=0.02), employed (p<0.001), smokers (p=0.04), and with better income (p=0.02).

Figure 1 illustrates the change in utilization rate after the implementation of the CQI intervention. It shows that the percentage of diabetic patients who sought care at the center for one year or more increased from 33.7% before the intervention to 51.8% after the intervention, and this difference was statistically significant.

Fig.2 illustrated causes of dissatisfaction from discontinuers, reasons for dissatisfaction such as the lack of health education about care of the feet, high cost, lack of appointment system, waiting time, and lack of provision of written instruction. These were called the “vital few”.

Fig.3 Pareto chart showing the reasons of discontinuation of using services as reported by patients who actually discontinued (n=75).

Table 2 shows requests for additional services as reported by continuous patients in the pre and post-intervention samples, the main requests were for free medication and ophthalmology clinic, which significantly decreased at the post-intervention phase, p<0.001 and p=0.032, respectively.

Discussion: The study findings are in congruence with [8] who found that individual factors affecting utilization of health services account for a quarter of the variance in utilization [9]. reported that the patient factors associated with non-attendance were being male, younger, and with lower socioeconomic status. These factors, except male gender, are in disagreement with our findings. This could be explained that difficulties in missing work to attend family practice or transport problems.

The study finding is incongruent with [10] who reported that education was strongly predictive of health-seeking activities in diabetes. They found evidence of less frequent self care behaviors among particularly high risk, diabetic patients with less education. The present study findings explained by the fact that the majority of our patients were illiterate.

The current study investigated the factors underlying discontinuation of using diabetic care services. The most frequently cited reasons were cost, long waiting time, and lack of compliance as identified from the Pareto chart. These factors formed the basis of the QI program. Similar reasons for underutilization also reported by [11] who mentioned degree of patient participation within consultations, attitudes of health professionals, family, and work commitments, and organization of the clinic. Similar factors reported in a study of the factors predisposing to non-attendance of diabetic patients by [12].

Diabetic patient requests related to ophthalmology clinic, free medications, and more investigations. These requests coincide with findings of the QI team outlined in the fishbone analysis. They are in congruence with [13] who found that

the availability of medication at the health centre was one of the most commonly mentioned factors among over 400 potential barriers or facilitators to care of patients with diabetes in primary care in Tunisia. This correlates with financial constraints being the most important patient-related factor, especially in developing countries, especially patients with chronic diseases [14].

In the present study satisfaction rates ranged between 62.9% and 70.5% in the pre-intervention sample, and between 87.0 and 98.0 in the post-intervention sample, similar improvement in patients' satisfaction was reported in a controlled trial of a multifaceted provider-level intervention to improve quality of care for rural patients with type-2 diabetes [15] .

5. CONCLUSION AND RECOMMENDATIONS

defining customer needs is the key to improve quality. Implementing QI programs, focusing on training physicians and nurses on diabetes guidelines, application of appointment system, and provision of health education materials were the main focus of improvement program.

6. LIMITATIONS OF THE STUDY

The study findings interpreted taking into account a number of limitations.

- The QI interventions may differ from one study to another according to different settings and approaches used so that generalizations are suitable for rural family practice setting.
- A possible co-intervention could have happened in the present study as the timing of the research coincided with the time of accreditation of rural family practice center, which could have affected the study findings.
- The bias of subjectivity and tendency of respondents to please the study team could have happened.

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Table 1 represents sociodemographic characteristics of studied group

	Group				X ² Test	p-value
	Continued (n=105)		Discontinued (n=75)			
	No.	%	No.	%		
Age (years):						
<60	64	61.0	33	44.0		
60+	41	39.0	42	56.0		
Range	30.0-73.0		30.0-82.0			
Mean±SD	53.8±9.6		57.5±8.9		7.01	0.008*
Sex:						
Male	23	21.9	29	38.7		
Female	82	78.1	46	61.3	5.98	0.01*
Education:						
Illiterate	74	70.5	40	53.3		
Read/write	15	14.3	25	33.3		
Basic	8	7.6	5	6.7	--	--
Secondary	4	3.8	3	4.0		
University	4	3.8	2	2.7		
Marital status:						
Unmarried	44	41.9	19	25.3		
Married	61	58.1	56	74.7	5.28	0.02*
Job:						
Unemployed/housewife	84	80.0	39	52.0		
Employee	4	3.8	5	6.7	16.11	<0.001*
Manual worker	17	16.2	31	41.3		
Smoking:						
None	91	86.7	55	73.3		
Ex-smoker	4	3.8	10	13.3	6.63	0.04*
Current smoker	10	9.5	10	13.3		
Crowding index:						
<2	38	36.2	22	29.3		
2+	67	63.8	53	70.7	0.93	0.34
Income:						
Insufficient	45	42.9	18	24.0		
Just sufficient	45	42.9	39	52.0	7.48	0.02*
Saving	15	14.3	18	24.0		

Table 2. Scores of satisfaction with services among patients in the pre and post-intervention diabetic group

	Time		Mann Whitney Test	p-value
	Pre (n=105)	Post (n=100)		
Structure: Range Mean±SD Median	24.0-100.0 75.9±29.9 100.0	58.0-100.0 92.3±6.7 95.0	0.10	0.76
Process: Range Mean±SD Median	24.0-100.0 70.3±28.3 85.0	76.0-98.0 92.7±3.4 93.5	30.01	<0.001*
Outcome: Range Mean±SD Median	22.0-100.0 77.1±30.7 100.0	74.0-100.0 92.7±5.7 94.0	0.82	0.37
Total: Range Mean ±SD Median	24.0-100.0 74.6±29.4 92.0	72.0-98.0 92.6±3.6 93.5	0.02	0.89

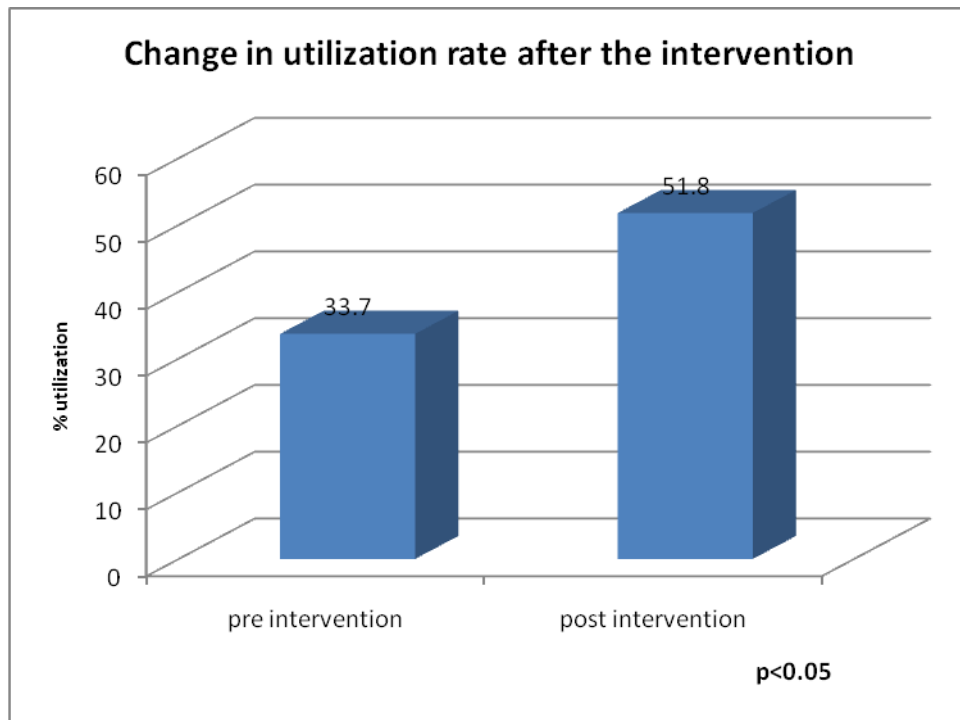


Fig.1 Change in diabetic care utilization rate after the intervention

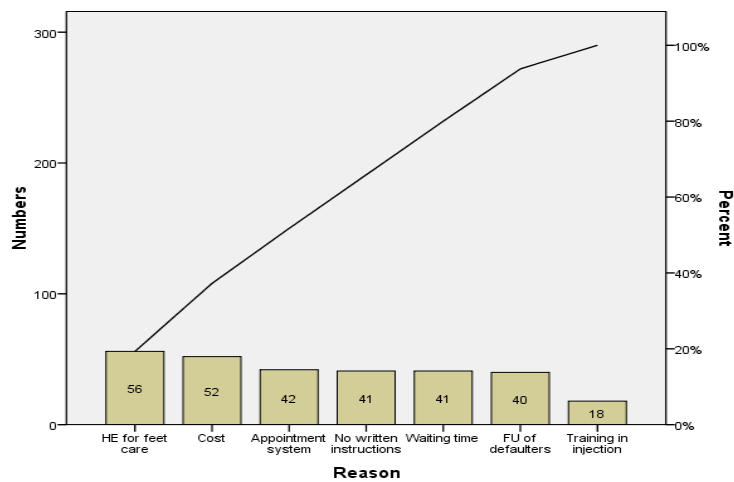


Fig.2 Pareto chart showing the causes of dissatisfaction with the services as reported by continuous patients (n=105)

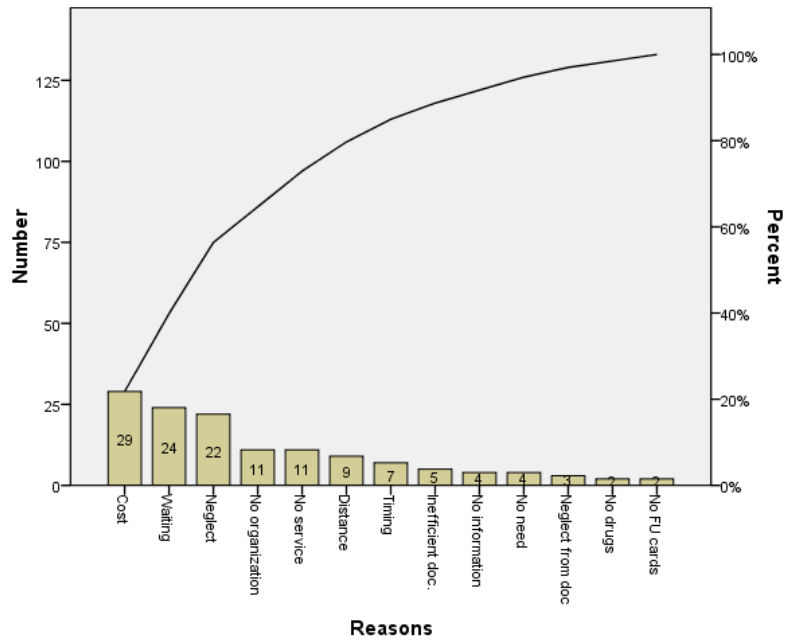


Fig. 3 Pareto chart showing the reasons of discontinuation of using services as reported by patients who actually discontinued (n=75)