The Quality of Primary Diabetes Care in the Bangkok Metropolitan Administration: Case Study of a Public Health Center

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ABSTRACT

This descriptive study was conducted for the purpose of describing the quality of primary diabetes care in a public health center in the Bangkok Metropolitan Administration. Survey data was collected for 4 months, from May to August 2010. A total of 165 diabetic patients completed a researcher-designed questionnaire for the purpose of obtaining information on the care processes received from care providers. Patients' Fasting Plasma Glucose (FPG) reports were obtained from the public health center to assess diabetic care outcomes. The data were analyzed using descriptive statistics and Pearson's Product Moment Correlation. Only 10.3% of the patients met the glycemic control goal (FPG ≤ 126 mg%). The findings revealed that 90.9 % of the patients demonstrated improper preventive care. Only 2.4% had annual foot examinations, 10.3% of the patients received aspirin treatment, 12.7% had HbA1C testing and 24.8% had annual retinal examinations. More than half of patients had complications: 35.7% had hypertension and 20.0% had heart disease. The results demonstrated that health promotion and continuity of care were the strength of diabetes care in public health centers and that they increased positive outcomes. Proper process for diabetes care was found to suggest an increase in positive outcomes, even though a wide gap exists between practice recommendations and the prevention and continuity of diabetes care in Bangkok. Thus, a need for primary diabetes care practice guideline development, with a supportive system to encourage physicians in using those guidelines, along with diabetes care system reform in public health centers is evident.

Key words: Quality of primary diabetes care, Bangkok Metropolitan Administration, Public health center

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Background and Significance of the Problem

Diabetes causes approximately 5% of all deaths globally each year[1]. Notably, 80% of all diabetics live in low and middle income countries[1]. Diabetes mellitus represents a significant public health problem in Thailand, with a prevalence rate ranking three times higher than the global average[2]. In 2009, the prevalence of diabetes among Thai adults was reported to be 6.9% of the population. The highest prevalence is in Bangkok (9.2%)[3]. Furthermore, reports from previous studies have shown that only 42.9% of Thai diabetics in the central region (except Bangkok) are able to maintain appropriate glycemic control[4]. No previous reports have shown information about glycemic control rates in Bangkok. Lack of awareness about diabetes, combined with insufficient diabetes care services can lead to complications. Only 3.7% of providers in the central region could regularly provide all prevention procedures to a patient to meet the standard goal, 30.3% of providers regularly provided annual foot examinations, while 30.0% regularly provided annual eye check-ups, 19.0% regularly provided HbA1Cc examinations at least once a year, and 11.0% regularly provided neuro-examinations at every visit to meet the standards of the Ministry of Public Health 4.

Diabetes care processes and care outcomes are the factors identified in the literature as quality indicators that increase the glycemic control rate[5]. Nagpal and Bhartia[6] evaluated the quality of care in known diabetic patients from the middle and high-income group populace of Delhi. They conducted a cross-sectional survey in 30 areas to recruit 25 subjects per area. A wide gap exists between practice recommendations and delivery of diabetes care in Delhi. In total, 13.0% of the patients had HbA1c estimation and 16.2% had a dilated eye examination in the last year, 32.1% had serum cholesterol estimation in the last year, and 17.5% were taking aspirin. An estimated 42.0% had an A1C value of 8%. Furthermore, there are four other published studies on the quality of diabetes care in Thailand, and western countries found a wide gap exists between practice recommendations and diabetes care. The results also showed that preventive care and health promotion improved the quality of care in terms of glycemic control[4,7,8,9] while three studies found that continuity of care was strongly associated with higher glycemic control rates[4,10,11].

Public health centers control the quality of diabetes care by providing that care with standards set by the Department of Health, Bangkok Metropolitan Administration. The goals of diabetes care in public health centers are that 60%[12] of people with diabetes receive the minimum standard in service delivery, preventive care and health promotion i.e. aspirin treatment, annual eye check-ups, annual foot examinations, annual neuro-examinations, HbA1C testing, triglyceride cholesterol testing and health education.

Public Health Center 33 is one of sixty four public health centers and provides primary care for approximately 75,000 people in 34 communities around the Bangkok-yai area. More than 300 people with diabetes are registered at Public Health Center 3313. Little is known regarding the quality of diabetes care which diabetics receive,

the outcome of care, and which factors are associated with better outcomes at Public Health Center 33. The purpose of this study was to describe the quality of diabetes care in terms of diabetes care processes and outcomes of care, as well as to determine the relationships among these factors. The results of this study might help raise public health center understanding of their own practices in terms of both failed and successful aspects.

Material and Method

The study was descriptive. The researcher obtained data by way of a structured questionnaire on diabetes care processes, including service delivery, preventive care, health promotion and continuity of care. In addition, 3-month fasting plasma glucose (FPG) reports of patients receiving care at Public Health Center 33 were obtained. The researcher assessed the quality of diabetes care process and outcome of care by developing a thirty-one item questionnaire based on the standards for diabetes care set by the Department of Health, Bangkok Metropolitan Administration[12] and the Diabetes Care Guidelines for Practitioners in Primary Care[14]. The two-part questionnaire was designed to obtain information regarding the diabetes patients, i.e. general information and the diabetes care process. Part one of the questionnaire consisted of seven items seeking general information about the patients and FPG levels. Part two of the questionnaire consisted of twenty-four items regarding the diabetes care process. It was composed of four components, i.e. service delivery, preventive care, health promotion and continuity of care. A checklist was used in both Parts I and II, and the items for Part II, for which the patients received care, met the standard were rated one, and the items for which the patients did not receive care but met the standard were rated 0. The total score of the diabetes care process was ranked from 0-24. The higher score represents a higher quality of diabetes care process. A pilot study was conducted with twenty diabetes patients attending clinics at other public health centers in order to test the reliability of the questionnaire. The reliability of the part two questionnaire in this study was determined at 0.775 by using the Kuder-Richardson Formula 20 (KR-20).

The sample consisted of patients attending Public Health Center 33. The patients were randomly selected, whereby inclusion criterion consisted of status as a patient who had attended Public Health Center 33 for at least one year. Using Power Analysis and Sample Size (PASS), determining $\alpha = 0.1$ and $\beta = 0.1$, $1-\beta = 0.9$, $r = 0.12\ 4$, a sample size of 162 patients was considered adequate for completing the questionnaire. However, 177 questionnaires were distributed to assure an adequate return rate. Survey data were obtained for four months, from May through August, 2010. 165 usable questionnaires were returned for a return rate of 93.2%. Data entries and analysis were performed by using SPSS version 13.0 software. Descriptive statistics were used to analyze the contents of the questionnaire after the data were standardized, while Pearson's product moment correlation was carried out to examine correlations among the quality care process score and FPG level.

Ethical considerations: Approval to conduct the study was granted by the Committee on Human Rights Related to Human Experimentation at the researcher's university (No 130.52, Date of approval was 18 December 2009). Each participant was informed about the research objectives, what was involved in participating in the study, maintenance of participants' anonymity and confidentiality, and the right to withdraw from the study at any time without negative repercussions. All participants were asked to sign a consent form before they completed the questionnaire or were interviewed.

Results

The majority (64.2%) of the patients were males. Patients had a mean age of sixty years, whereby more than half (65.9%) had some primary education or less. Most (82.4%) reported regular visits to the doctor at the public health center. More than half of patients had complications (60.6%), i.e. 35.7% had hypertension and 20.0% had heart disease. (See Table 1). The average period for utilizing diabetes care services at the public health center was five years and the average duration of the disease was six years.

Table 1 General characteristics (n = 165)

General characteristics	No.	%
Gender		
Female	59	35.8
Male	106	4.2
Education (n = 144)		
Primary education or less	95	65.9
High school	44	30.6
Bachelor degree	5	3.5
Service utilization		
Regularly	136	82.4
Not regularly	29	17.6
complication		
No complication	65	39.4
Complication	100	60.6
Retinopathy	1	0.6
Hypertension	59	35.7
Foot ulcer	3	1.9
Heart disease	33	20.0
Multi-health problems	4	2.4

Quality of diabetes care process: The quality of the diabetes care process was explained in terms of service delivery (medical treatment, preventive care, and health promotion) and continuity of care. Regarding the standards for diabetes care set by the Department of Health, Bangkok Metropolitan Administration and the Diabetes Care Guidelines for Practitioners in Primary Care, the results indicated that the public health center had provided service delivery and continuity of care that fell short of the goal. As shown in Table 2, none of the patients received service delivery at all. Only 5.5% received the continuity of care that met the standard.

In detail, 29.1% of patients received all the medical treatment procedures that met the standard, 96.4% of the patients reported that they had received services in clinics with sufficient staff, medicine and other instruments, and 93.9% had received correct diabetes mellitus drugs. Only 6.1 % of patients received all the preventive procedures that met the standard. The majority of the patients had blood pressure taken (89.1%) and FPG examinations at least four times per year (80.6%). However, only a small proportion underwent eye annual check-ups (24.8%) and neuro- examinations (6.7%).

A small number of patients received all preventive care procedures that met the standard (6.1%), 41.2% of the patients had triglyceride and cholesterol testing, 12.7% had HA1C testing, 10.3% had aspirin treatment, 9.1% had had urinalysis and only 2.4% had foot examinations (See Table 2). Regarding health promotion, the findings showed that the public health center provided health promotion that met the standards of care. The majority of the patients (85.5%) and their families (83.0%) had diabetes education. Furthermore, regarding continuity of care, the vast majority of the patients (93.9%) met the same physician at every visit and had appointments to visit their doctor. Follow-up was carried out for a small number of patients (26.1%) if they missed an appointment. However, only 16.9% of patients had home visits by nurses (See Table 2).

Care Outcomes: The outcome of care (See Table 2) was measured from an average three-month FPG level report, whereby it was found that 10.3% had good glycemic control (FPG< 126 mg%). The average FPG level was 179.3 mg% (min = 90 mg%, max = 329, mg%). Thus, a statistically significant relationship was indicated between health promotion, continuity of care, overall care processes and diabetes care outcomes (See Table 3).

Table 2 Process and outcome of diabetes care in Public health center (n = 165)

Quality of Care	Factors	Standard	Patients received care met the standard	
			No	%
Process of care				
	Service Delivery		0	0.00
		Medical treatment	48	29.1
		Services with sufficiency of staff, medicine, and other instruments	159	96.4
		Got correct diabetes mellitus drugs	155	93.9
		No long waiting for services	86	52.1
		Preventive care	10	6.1
		Blood pressure examinations at least 4 times/yr	147	89.1
		Fasting blood sugar examinations at least 4 times/yr	133	80.6
		Triglyceride and cholesterol testing once a year	68	41.2
		Eye annual check-ups	41	24.8
		HbA1Cc examination at least once a year	21	12.7
		Aspirin taking	17	10.3
		Urine examination	15	9.1
		Neuro- examinations at every visit	11	6.7
		Foot examination at least once a year	4	2.4
		Health promotion	106	64.2
		Individual health education	141	85.5
		Family education	137	83.0
	Continuity of Care		9	5.5
		Meet the same physician every visit	155	93.9
		Got an appointment	86	52.1
		Follow by health care provider (if you loss follow up)	43	26.1
		Home visits 4 times a year	28	16.9
Care Outcome		Glycemic control		
		Fasting plasma glucose < 126 mg%	17	10.3
		mean = 179.3, min = 90, max = 329		

Table 3 Summary association/no association among variables and outcome of care

Variables	r	*p-value*	Result
Service delivery	0.107	0.308	No Association
Preventive care	0.171	0.103	No Association
Health promotion	0.213	0.041*	Association
Continuity of care	0.189	0.072*	Association
Overall Diabetes care process	0.214	0.040*	Association

* Statistically significant at $\alpha = 0.10$

Discussion

Studies performed at the Public Health Center have consistently indicated that the management of preventive care fails to meet the required standards set for proper disease management in public health centers. This study demonstrates that only a few diabetics received the proper preventive care suggested by the standards. In public health centers, nearly all preventive procedures, e.g. annual eye check-ups, triglyceride and cholesterol testing, HbA1C, aspirin treatment, urinalysis and neuro-examinations, require a physician's prescription. The lack of suggested preventive care practice may be due to the shortage of available physicians in public health centers. Only three physicians provide care in the Outpatient Department of the Public Health Center. The proportion of physicians per population was 1:25,000 people, which is lower than the standard. This has lead to physicians experiencing increased workloads. Furthermore, the staff do not have practice guidelines so some preventive procedures are missed. The findings further suggest that future efforts to improve the quality of diabetes care should focus on rates of, and barriers to, diabetes care regimens. These results are similar to previous studies in Thailand, wherein low rates of preventive care have been found among diabetics[4,15]. The findings of this study are similar to those of studies by Dunn and Pickering[16], Chin and colleagues[9], Grant[17] and Saaddine and colleagues[18], which were conducted in western countries and found low numbers for creatinine and cholesterol tests. In addition, foot and eye examinations were performed in primary care. The authors explained that the shortage of staff was the major cause for the low performance rates of preventive care.

Continuity of care remains an important component of diabetes care as the strong associations between continuity of care and glycemic control have shown. Furthermore, large differences exist between practices in home visiting rates and the standards. Only a few participants with diabetes had received home visits which met the standard. The major care providers performing home visits are nurses. Other barriers to conducting home visits include nursing work overloads which represent a heavy cost in terms of time. When compared with the home visit rate found in studies conducted

in England (29.9%)[19], and in the central region of Thailand (36.3%)[4], the home visit rate found in this study was slightly lower. This finding suggested that health education programs need to be developed to train health volunteers to help nurses in visiting people with diabetes in the community. Having health care teams and health volunteers define their roles and support health volunteer services is the key to doing so and may improve health outcomes.

The results showed health promotion at public health centers to be outstanding. To promote diabetic health, nurses provide health education for both individuals and groups before patient(s) meet physicians and when they visit patients at home. Diabetes education addresses physical activities, dietary control, stress, smoking and alcohol use. More than 80% of the diabetics and their families received diabetes education as necessary according to the standards. The findings of this study indicated that health promotion results in glycemic control (See Table 3). This may be explained in that the majority of the patients were old diabetes cases with an average duration of 6 years. Thus, the participants had a variety of experiences in visiting the diabetes clinic and education helped the diabetics initiate effective self-management and cope with diabetes.

This is the first report on the quality of diabetes care at public health centers and the findings demonstrate sub-optimal quality care. The fact that a low glycemic control rate was found in this study may reflect the ineffectiveness of the diabetes care process. The findings showed that only 10.3% of the diabetics attending the public health center reached the desired level of glycemic control. When compared with the glycemic control rates found in studies conducted in Western countries and other Thai settings[16,20-22], the glycemic control rate found in this study was slightly lower. This might be the result of differences in the setting as well as the characteristics of the patients attending specific health care institutions. For example, those attending tertiary care facilities usually have more severe cases of diabetes and adhere to practice standards better than those receiving care at public health centers.

Limitations

Several limitations should be noted. Diabetes care is complex because it involves both self-care by the patient and administration of key processes of care by the provider. Nevertheless, quality of care was assessed only in terms of technical quality and did not include amenities or the interpersonal domain. Our analysis of the actions at a single visit does not account for the series of changes potentially occurring over consecutive visits or for acute problems capable of dominating a single visit to the exclusion of other problems.

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References

1. World Health Organization. Diabetes. [internet]. 2010 [cited 2010 Sep 14]. Available from: http://www.who.int/diabetes/en/
2. Aekplakorn W, Stolk R, Neal B, Suriya-wongpaisal P, Chongsuvivatwong V, Cheepudomwit S, et al. The prevalence and management of diabetes in Thai adults. Diabetes Care 2003; 26: 2758-63.
3. Akepharakorn,W. editors. The 4th physical examination of Thai people 2008-9 Report. Nonthaburi: The graphic system Ltd; 2010.
4. Koshakri R, Suwanaroop N, Pancharoenworakul K, Therateph C, Chrisman N. Quality of diabetes care in primary care services system in central Region. Thai J Nurs Res 2009; 13: 167-80.
5. Donabedian A. Evaluating the Quality of Medical Care. The Milbank Quarterly 2005; 83: 691-729.
6. Nagpal & Bhartia. Quality of Diabetes care in the middleand high-income group populace. Diabetes Car 2006; 29: 2341-8.
7. Mary K. Rhee, Curtiss B. Cook, Virginia G. Dunbar, Rita M. Panayioto, Kathy J. Berkowitz, Barbara Boyd, et al. Limited health care access impairs glycemic control in low income urban African Americans with type 2 diabetes. J Health Care Poor U 2005; 16: 734-46.
8. Akhter J. Quality of diabetes care and management of general physicians in Karachi, Pakistan: response to Nagpal and Bhartia. Diabetes Care 2007; 30: e27.
9. Chin MH, Auerbach SB, Cook S, Harrison JF, Koppert J, Jin L, et al. Quality of diabetes care in community health centers. Am J Public Health 2000; 90: 431-4.
10. Parchman M, Pugh J, Noel P, Larme, L. Continuity of Care, Self-Management Behaviors, and Glucose Control in Patients With Type 2 Diabetes. Medical Care 2000; 40: 137-44.
11. Parchman ML, Burge SK. Continuity and quality of care in type 2 diabetes: a Residency Research Network of South Texas study. J Fam Pract 2002; 51: 619-24.
12. Health Department. Health indicator. Bangkok: Bangkok Metropolitan Administration (BMA); 2009. (In Thai).
13. Public health center 33. Community health Report 2010. Bangkok: 2010. (In Thai).
14. Poawilai K, Ungsusin K, Wannasaeng S, Junprasert S, Oungpheepattanakul B, Deerojjanawong C. Diabetes guideline for practitioner in Primary Care Units in Thailand. Bangkok: Thai endocrine society and Ministry of Public Health. 2004. (In Thai).
15. Nitiyanant W, Chetthakul T, Sang-A-kad P, Therakiatkumjorn C, Kunsuikmengrai K, Yeo J. A survey study on diabetes management and complication status in primary care setting in Thailand. J Med Assoc Thai 2007; 90: 65-71.
16. Dunn N, Pickering R. Does good practice organization improve the outcome of care for diabetic patients? Brit J Gen Pract 1998; 48: 1237-40.
17. Grant RW, Buse JB, Meigs JB. Quality of diabetes care in U.S. academic medical centers: low rates of medical regimen change. Diabetes Care 2005; 28: 337-442.

18. Saaddine JB, Engelgau MM, Beckles GL, Gregg EW, Thompson TJ, Narayan KM. A diabetes report card for the United States: quality of care in the 1990s. Ann Intern Med 2002; 136: 565-74.
19. Aylin P, Majeed F, Cook D. Home visiting by general practitioners in England and Wales. Br Med J 1996; 313: 207-10.
20. Rawdaree, Ngarmukos, Deerochanawong, Suwanwalaikorn, Chetthakul, SKrittiyawong. Thailand Diabetes Registry (TDR) Project: Clinical status and long term vascular complications in diabetic patients. J Med Assoc Thai 2006; 89(suppl1): s1-9.
21. Saaddine JB, Cadwell B, Gregg EW, Engelgau MM, Vinicor F, Imperatore G, et al. Improvements in Diabetes Processes of Care and Intermediate Outcomes: United States, 1988-2002. Ann Intern Med 2006; 144: 465-74.
22. Pengpara U, Jongjirasiri N, Hongumphai P. The Assessment of the Universal Health Care Coverage Project in Pattani Province. Health Science 2003; 12: 407-19.

คุณภาพของการดูแลผู้ป่วยเบาหวานในระบบบริการปฐมภูมิในกรุงเทพมหานคร: กรณีศึกษาศูนย์บริการสาธารณสุขแห่งหนึ่ง

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บทคัดย่อ

วัตถุประสงค์ของการวิจัยเชิงบรรยายนี้ เพื่ออธิบายคุณภาพของระบบบริการดูแลผู้ป่วยเบาหวานในศูนย์บริการสาธารณสุขแห่งหนึ่ง ในกรุงเทพมหานคร ประกอบด้วย กระบวนการดูแลผู้ป่วยเบาหวาน และการควบคุมระดับน้ำตาลในเลือด รวมทั้งความสัมพันธ์ของปัจจัยดังกล่าว การศึกษานี้ ทำการสำรวจผู้ป่วยเบาหวานในศูนย์บริการสาธารณสุขจำนวน 165 คน เก็บข้อมูลเป็นเวลา 4 เดือน ตั้งแต่เดือนพฤษภาคม- สิงหาคม 2553 และบันทึกผลระดับน้ำตาลในเลือดย้อนหลัง 3 เดือน วิเคราะห์ข้อมูล โดยสถิติเชิงพรรณนาและค่าสหสัมพันธ์เพียร์สัน

ผลการศึกษาพบว่าร้อยละ 10.3 ของผู้ป่วยเบาหวานสามารถควบคุมระดับน้ำตาลในเลือดตามเกณฑ์มาตรฐาน ผลการศึกษาชี้ให้เห็นว่าผู้ป่วยเบาหวาน ร้อยละ 90.9 ได้รับการดูแลด้านการป้องกันภาวะแทรกซ้อนที่ไม่เหมาะสม กล่าวคือมีเพียงร้อยละ 2.4 ได้รับการตรวจเท้าประจำปี ร้อยละ 10.3 ของผู้ป่วยเบาหวานได้รับยาแอสไพริน ร้อยละ 12.7 ได้รับการตรวจหาระดับ HbA1C ร้อยละ 24.8 ได้รับการตรวจตาประจำปี ผู้ป่วยเบาหวานมากกว่าครึ่งหนึ่งมีภาวะแทรกซ้อน ร้อยละ 35.7 เป็นโรคความดันโลหิตสูง ร้อยละ 20.0 เป็นโรคหัวใจ ผลการศึกษายังแสดงให้เห็นถึงการสร้างเสริมสุขภาพ และการดูแลอย่างต่อเนื่องเป็นจุดแข็งของการดูแลผู้ป่วยเบาหวานในศูนย์บริการสาธารณสุข และมีผลทำให้ผู้ป่วยเบาหวานควบคุมระดับน้ำตาลในเลือดได้ดีขึ้น

จากผลการวิจัยครั้งนี้มีข้อเสนอแนะให้ผู้กำหนดนโยบาย ได้เร่งพัฒนาแนวปฏิบัติ และมีระบบสนับสนุนให้มีการใช้แนวปฏิบัติในการดูแลผู้ป่วยเบาหวานในศูนย์บริการสาธารณสุข และปฏิรูประบบการดูแลผู้ป่วยเบาหวาน และเพื่อเป็นการพัฒนาคุณภาพการให้บริการผู้ป่วยเบาหวานในศูนย์บริการสาธารณสุขต่อไป

คำสำคัญ: คุณภาพการดูแลผู้ป่วยเบาหวานระดับปฐมภูมิ, กรุงเทพมหานคร, ศูนย์บริการสาธารณสุข

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