Original Articles/นิพนธ์ต้นฉบับ

Implementation and Evaluation of Pharmaceutical Care Service for Refill Clinic at Ramathibodi Hospital.

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Abstract

A pharmaceutical care service (PCS) was initiated at refill clinic, Ramathibodi Hospital. The objective of this study was to implement and evaluate PCS program using Donabedian's (Structure-Process-Outcome) conceptualization. The study was divided into 4 phases; 1) project initiation, 2) preparation, 3) implementation, and 4) program assessment.

The project was approved in March 2007. In the preparation phase, all structures, work place, facilities (such as computer software), pharmacists, and work process were planned for the provision of PCS. During the one-year implementation phase (July 2007 to June 2008), a total of 2,155 patients with chronic diseases and stable condition were recruited to receive PCS together with refill prescribing process. The pharmacists recorded prescription data, provided pharmaceutical care services to 2,809 encounters, and gave 3,345 refill prescriptions. Between October 2007 and June 2008, 1,545 of the 2,548 encounters (60.64%) were returned for refills. Of these, 1,111 encounters (71.91%) were refilled with PCS process. For clinical outcomes, pharmacists interviewed 154 patients and identified 72 DTPs, 61.11% of which were non-compliance. When interventions are recommended for the problems, physicians accepted 86.36% of pharmacists' recommendations. For economic outcomes, benefit as drug cost saving (from duplicates and oversupplies) was 419,214.48 Baht and the benefit to cost ratio was 2.45 : 1. For humanistic outcomes, 95.2% of the respondents recommended their relatives or friends with problems or doubts about medication to receive PCS.

In conclusion, PCS could reduce DRPs and save drug cost. It is recommended that the program should be expanded to cover other groups of patients so as to achieve more efficient use of health resources.

Keywords: Pharmaceutical care, outcomes, refill clinic

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Introduction

When medications are prescribed to patients with chronic diseases, the main purpose is to achieve an optimal therapeutic outcome, which in the past has been defined as "the right drug for the right patient, at the right time". Since the 1990 when pharmaceutical care is initiated, optimal therapeutic outcomes imply the absence of drug-related problem (DRP), and good health outcomes.[1] Pharmaceutical care is a new professional practice that aims to identify, resolve, and prevent medicinal product and health-related problems. DRP could be the negative consequences of a single patient who has seen several prescribers, the explosion of drug products and drug information presently on the market, the increased complexity of drug therapy, and the significant level of drug-related morbidity and mortality associated with drug use.

Long-term pharmacotherapy is usually carried out with refill prescriptions. This model of prescribing has advantages and disadvantages. It can reduce the workload for the physicians and is convenient for the patients to get medications.[2] On the other hand, it may be associated with inadequate patient medication from medication behavior inappropriately, including refill non-adherence.[2,3] The process may involve both undersupply and oversupply which might vary due to different attitudes between prescribers and patients, different therapeutic indications and reimbursement systems.[4] Undersupply can lead to treatment gaps that may negatively impact on therapeutic outcome[5] and oversupply or drug stockpiling can lead to high unnecessary costs.[6] Both undersupply and oversupply of drug are associated with increased hospitalization rates.[7] Medication reviews can reduce the drug-related problems associated with repeat prescriptions[2,8], because it ensures that every refill prescription is still appropriate and effective. Repeat prescribing process is usually resulted in significant changes in patients' drugs[9] and to make savings in the drugs bill more than the cost of the intervention without affecting the workload of physicians.[10] In Thailand, very few studies has demonstrated about PCS with refill medications but there are evidence support that PCS impact on positive outcomes in chronic conditions.[11-13]

The Faculty of Medicine at Ramathibodi Hospital is a tertiary care institution with many specialists from different disciplines and equipped with hi-technology facilities and equipments. It offers consultation and referral from hospitals all over the country. An increasingly large number of patients come to get medical services each year. The hospital provides services to over 5,000 outpatients daily and about 1,000 in-patients with severe illnesses and complications.[14] With the heavy daily workload, there are many problems in medication use such as the problem of coordinating information when a patient goes to several different specialists. Unfortunately, these physicians may have incomplete information about the full set of medications that the patient is taking. Moreover, the hospital faces the problem of drug expenditures control. The hospital administrator had set several policies in order to use their limited budgets and resources to the most efficient and greatest possible benefit. One of these policies was to implement pharmaceutical care service (PCS) and refill medication at the outpatient pharmacy department for controlling expenses and improving therapeutic outcomes. This study was designed to set up a PCS at the outpatient pharmacy department by using Donabedian's conceptualization which defines the three dimensions of quality assurance in health care as being structure, process, and outcome (SPO model). Structure is the physical and organizational properties of the settings in which care is provided, while process is the treatment or service being provided to the patient, and outcomes are the results of the treatment.[15]

Objective

To implement and evaluate pharmaceutical care service (PCS) in refill clinic at Ramathibodi Hospital.

Method

This study was conducted at the outpatient pharmacy department, Ramathibodi Hospital between May 2007 and June 2008. The program was divided into 4 phases: 1) project initiation, 2) preparation, 3) implementation, and 4) program assessment.

Phase 1. Project initiation (March 2007)

The hospital director set a policy to restrict the quantity of drug dispensed per prescription for patients with chronic disease and stable condition. Each refill prescription was for a 2-month supply for patients who live in Bangkok and vicinity, and a 3-month supply for patients who live in other provinces. Patients can take the refill prescriptions to be filled at the outpatient pharmacy department without seeing the physician.

Phase 2. Preparation (May 2007 - July 2007)

This study was approved by Committee on Human Rights Related to Researchers Involving Human Subjects of Faculty of Medicine at Ramathibodi Hospital. In this phase, structures, human resources, and processes for services were prepared to support PCS activities in the next phase. For structure dimension, a "designated" area at the outpatient pharmacy department was set up and facilitations were prepared to assist the work activities. Other considerations were internet access to medical, drug and other health related information, and software programs such as "Prescription", "Viewlab", and "Appointment" to retrieve information of prescription profile, laboratory data, and appointment date, respectively. Another program called "PharmCare" which was designed and developed for collecting data from PCS and making refill prescriptions especially. For manpower, four pharmacists who had volunteered to provide PCS were put in charge of the program. They were trained to gain experience in providing pharmaceutical care and authorized to modify work procedures to facilitate the patient care process before implementing the services. For process dimension, a management plan was developed to facilitate patient care process. PCS and refill process were added to the traditional pharmacy service as a new workflow.

Phase 3. Implementation (July 2007 - June 2008)

During the one-year implementation phase, four pharmacists took turns to provide PCS. Each month, two pharmacists would be on duty, one at a time. Patients with chronic diseases, who registered under the Universal Health Care Coverage (UC Scheme) and the Social Security Scheme (SSS) and whose condition remained stable and with at least one refill, were recruited into the program.

During consultation, the pharmacist retrieved, reviewed patient's data, and recorded demographics, medical and prescription data into the "PharmCare" program. Pharmacists then interviewed patients and/or caregiver to identify drug therapy problems (DTPs) which were classified into seven categories by Strand LM, et al.[16] as additional drug therapy, unnecessary drug therapy, ineffective drug, dosage too low, adverse drug reactions, dosage too high, and non-compliance. If there were a major change in drug therapy, the physician would be consulted. Pharmacist could make minor changes to the prescription such as day supplies. The pharmacist would make one or two refills, and then dispensed medications until the next appointment. All of the pharmacist's interventions and activities were recorded into "PharmCare" Program. Patients were told to bring back their medications for the next visit. This was to assess compliance by pill count and/or self-report technique from patient or caregiver. Some of the patients were

given a questionnaire asking about the overall satisfaction to provide this program.

Phase 4. Program assessment

Data were analyzed as descriptive statistics using Microsoft Access 2003, Microsoft Excel 2003, and SPSS version 13. The program was evaluated in three dimensions: clinical, economic, and humanistic outcomes. Clinical outcomes were measured as number and percentage of DTPs detected and resolved. Economic outcomes were determined by cost-benefit ratio. Costs were salary and supplies used and benefits were drug cost saving which was determined from the difference between the value of prescribed medicines and that of the pharmacist dispensed. Humanistic outcomes were the respondents' opinion towards PCS and the mean score of respondents' satisfaction of a 5-point scale of least satisfied to very satisfied.

Results

During the one-year implementation phase (July 2007 and June 2008), patients recruited into the program are gradually increased as shown in Figure 1. Pharmacists provided PCS to 2,155 patients (2,863 encounters). Of these, 38.42% were male and 61.58% were female. The mean age was 49.93 ± 16.50 years with range of 1-95 years. Patients were registered under UC scheme of other hospitals (38.93%), SSS of Ramathibodi Hospital (36.89%), UC scheme of Ramathibodi Hospital (18.79%) and SSS of other hospitals (3.85%). Demographic data of patients received pharmaceutical care service are summarized in Table 1. Pharmacists gave 3,345 refill prescriptions (with 9,728 refill items) for 2,809 encounters. Most patients (85.51%) had one refill prescription. Refill items were for cardiovascular and hematopoietic system (26.29%), vitamins and minerals (20.11%), endocrine and metabolic system (18.17%) and neuromuscular system (13.59%), respectively.

Between October 2007 and June 2008, 2,548 encounters were expected to refill 7,069 medication items but 1,111 encounters (43.60%) returned for 3,220 refill items (45.55%) in PCS process as shown in Figure 2. Some people came for refills outside the PCS office hours.

1. Drug therapy problems (DTPs) detected and resolved

Overall, 72 DTPs were identified from 154 interviews. Most of the DTPs were non-compliance (61.11%), unnecessary drug therapy (15.28%) and ADR (8.33%). From the problems detected, 14 inter-

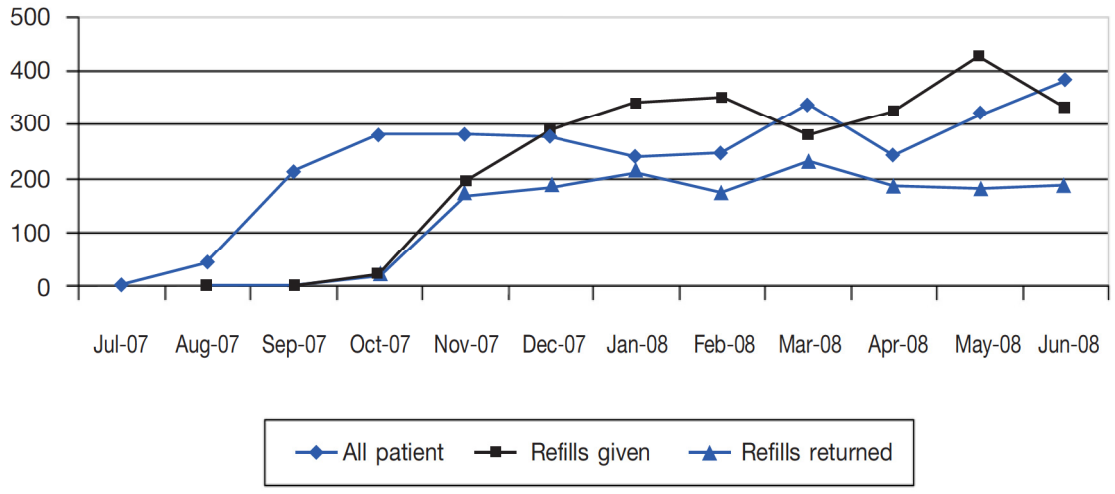

Fig.1 *Number of encounters with pharmaceutical care services in refill clinic at Ramathibodi Hospital*

Table 1. Demographic data of patients received pharmaceutical care service

Characteristics	Refill clinic	(%)
Gender		
Male	828	(38.42)
Female	1,327	(61.58)
Age (mean ± S.D.)	(49.93 ± 16.50)	
< 10	29	(1.35)
10-19	58	(2.69)
20-29	154	(7.15)
30-39	310	(14.39)
40-49	452	(20.97)
50-59	509	(23.62)
60-69	402	(18.65)
70-79	196	(9.10)
≥ 80	45	(2.09)
Type of health care insurance		
1. UC scheme of Ramathibodi Hospital	405	(18.79)
2. Social Security Scheme (SSS) of Ramathibodi Hospital	795	(36.89)
3. UC scheme of other hospitals	839	(38.93)
4. Social Security Scheme (SSS) of other hospitals	83	(3.85)
5. Others	33	(1.53)
Number of patients	2,155	(100.00)
Number of encounters	2,863	
Number of refill prescriptions	3,345	

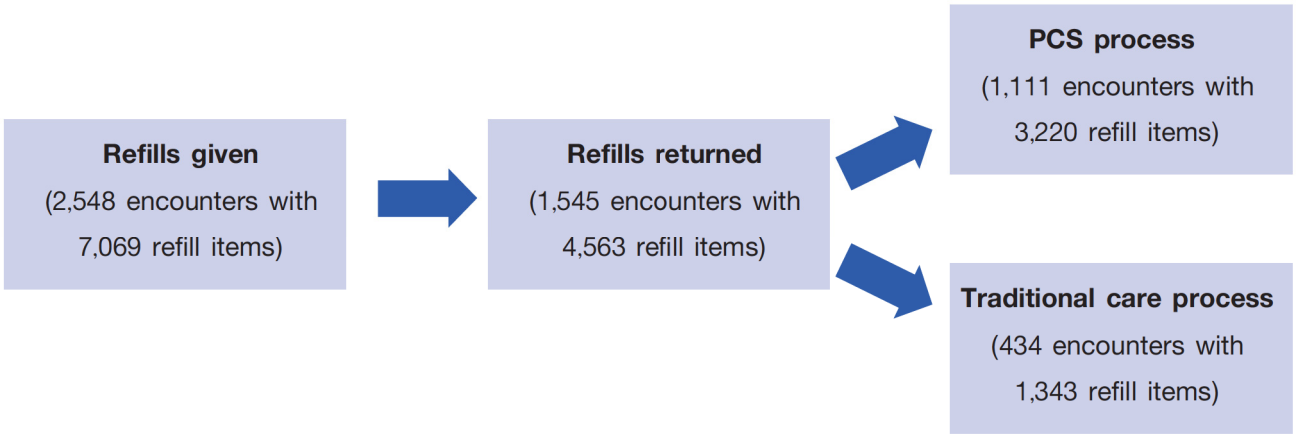

Fig.2 *Number of encounters returned to get refill medications (October 2007 - June 2008)*

Table 2. Benefit to cost ratio of providing pharmaceutical care services with refill prescribing process

	Value (Baht)	Total
Benefit:		
Drug cost decreased (2,520 refill items)	430,335.73	
Drug cost increased (78 refill items)	-11,121.25	419,214.48
Cost:		
Pharmacist's salary	163,440.00	
Supplies	7,338.28	170,778.28
Benefit to cost ratio		2.45 : 1

ventions were given which required physician consultation; 12 cases (85.71%) were accepted.

2. Drug cost saving

When patients returned to get refill medications, pharmacists assessed adherence and calculated day supplies, and then adjusted the amount of medications in the prescriptions. Of the 3,220 refill items, pharmacists decided to reduce drug quantity of 2,520 refills (78.26%), either because of underuse or oversupply (table 2). It helped decrease drug cost by 430,335.73 Baht. On the other hand, supplies of 78 items (2.42%) were increased because some patients took more medicines than prescribed, some lost their medicines or some extended the appointment date. Net drug cost saving as benefit was 419,214.48 Baht in the one-year period and the average drug cost saving per encounter was 377.33 Baht. Therefore, the benefit to cost ratio was 2.45 : 1 as shown in Table 2.

3. Patient's satisfaction for pharmaceutical care services

From the questionnaires, 22 of 55 (40%) were returned. The respondents (95.2%) will recommend their friends and relatives with problems or doubts about medication to seek PCS. Out of the 5-point scale, the respondents were satisfied with pharmacists' personality (4.91±0.30), enthusiasm and willingness to service (4.67±0.58), attention to identify and resolve DTP (4.57±0.51) and appropriate work place (4.36±0.90). The respondents felt good that the pharmacists gave recommendations about refills (4.75±0.44) and the patients had more knowledge about medication use (4.67±0.48). The respondents' overall satisfaction was 4.70±0.47.

Discussion

It was extremely difficult to establish a new practice at a busy pharmacy. The key to a successful practice was to show how to add new patients continually into efficient work flow processes. The purpose of implementation phase was to establish an efficient work flow process. Documentation with easy access to the computer was very important during implementation of the pharmaceutical care process.[17] Another difficulty in the project was the additional workload of pharmacists. Most pharmacists had been loaded with routine work, such as checking and dispensing medicines. Therefore, very little time was available for providing PCS which is a time consuming task. With the inadequate number of pharmacists to do even the routine works, this would greatly affect the provision of PCS and during the implementation, and hence it was carried out irregularly (just one or two hour in some days). Therefore, more pharmacists should be available at the "designated" area for pharmaceutical care, so that the services may run continually and smoothly.

For problems with drugs, non-compliance came

first, with more than one half of all DTPs (58.04%). However, most patients had only one visit during the data collection period. Some DTPs might not be found in the first time of counseling but might be detected in the following visits. In addition, some patients returned for refills early in the morning or during holidays when PCS was not provided. These patients were not interviewed to follow-up with the detected DTPs and/or identify for a new DTP. Therefore, the PCS should be opened in the evening or holidays to expand the service.

Most refill quantities (78.26%) were lower than what the physician prescribed, with only 2.42% more drug dispensed. Most patients did not require their full quota of prescribed drugs because they might have problems from oversupply of medications or unused medications. In this study, net drug cost saving was 419,214.48 Baht which was underestimated because cost consequences from detecting and resolving DTPs were not determined. The savings were from drug cost alone. Some pharmacist's intervention could save patient's life and might result in avoiding additional health expenditures. This program showed that for every Baht invested in the provision of pharmaceutical care to ambulatory patients, 2.45 Baht could be saved by reducing drug expenditures.

In conclusion, the provision of pharmaceutical care at the outpatient pharmacy, Ramathibodi Hospital had positive impact to reduce DTPs and save drug cost. Additionally, this study proved that pharmacists' works are cost-effective to the health care system. Therefore, the program should be expanded to cover a larger group of patients, so that more cost-effective services may benefit both the patients and the provider.

Recommendations

- Documentation program for PCS as "Pharm-Care" program should be developed to facilitate data collection and linked to other software programs of Ramathibodi Hospital.
- Further research should focus on PCS for specific chronic disease or disease management program.
- Further research should focus on the quality of pharmaceutical care in terms of real clinical outcome and economic outcome, including cost consequences of pharmacists' interventions.
- The program should be expanded to other groups of patients such as providing refill prescribing process for CSMBS patients.

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Original Articles/นิพนธ์ต้นฉบับ

การดำเนินการและประเมินผลการให้บริบาลทางเภสัชกรรมผู้ป่วยนอก ในคลินิกเติมยา ณ โรงพยาบาลรามาธิบดี

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บทคัดย่อ

มีการริเริ่มโครงการให้บริการงานบริบาลทางเภสัชกรรมแก่ผู้ป่วยนอกในคลินิกเติมยา โรงพยาบาลรามาธิบดี ซึ่งมีวัตถุประสงค์เพื่อดำเนินการและประเมินผลโครงการการให้บริการงานบริบาลทางเภสัชกรรม โดยใช้หลักการของ Donabedian อันประกอบด้วยโครงสร้าง กระบวนการดำเนินงาน และผลลัพธ์ที่วัดได้ การศึกษานี้แบ่งออกเป็น 4 ระยะ คือ 1) ริเริ่มโครงการ 2) เตรียมการ 3) ดำเนินงาน และ 4) ประเมินโครงการ

โครงการนี้ได้รับอนุมัติในเดือนมีนาคม พ.ศ. 2550 โดยมีการจัดเตรียมโครงสร้าง เช่น สถานที่ เครื่องอำนวยความสะดวก โปรแกรมคอมพิวเตอร์ เภสัชกรผู้ให้บริการ และขั้นตอนการดำเนินงาน เพื่อสนับสนุนการดำเนินงานบริบาลทางเภสัชกรรม ผลจากการดำเนินงานตลอดระยะเวลา 1 ปี (เดือนกรกฎาคม พ.ศ. 2550 ถึงมิถุนายน พ.ศ. 2551) ให้บริการงานบริบาลทางเภสัชกรรมแก่ผู้ป่วยโรคเรื้อรังที่มีอาการคงที่รวมทั้งสิ้น 2,155 คน โดยเภสัชกรทำหน้าที่บันทึกข้อมูลใบสั่งยาให้บริการงานบริบาลทางเภสัชกรรมแก่ผู้ป่วยจำนวน 2,809 ครั้ง และมีการจัดทำใบสั่งเติมยาจำนวน 3,345 ใบ ในระหว่างเดือนตุลาคม พ.ศ. 2550 ถึงเดือนมิถุนายน พ.ศ. 2551 มีการนัดผู้ป่วยกลับมาเติมยาจำนวน 2,548 ครั้ง แต่มีผู้ป่วยกลับมาเติมยาเพียง 1,545 ครั้ง หรือคิดเป็นร้อยละ 60.64 ซึ่งในจำนวนนี้มีผู้ป่วยกลับมารับบริการเติมยาในโครงการบริบาลทางเภสัชกรรมจำนวน 1,111 ครั้ง หรือคิดเป็นร้อยละ 71.91 ของจำนวนผู้ป่วยที่กลับมาเติมยาทั้งหมด จากการประเมินผลลัพธ์ด้านคลินิกพบปัญหาจากการใช้ยาจำนวน 72 ปัญหา จากผู้ป่วยจำนวน 154 คน ซึ่งส่วนใหญ่เป็นปัญหาจากการไม่ให้ความร่วมมือในการใช้ยาถึงร้อยละ 61.11 เมื่อเภสัชกรพบปัญหาแล้วปรึกษาแพทย์ พบว่าแพทย์ยอมรับคำแนะนำจากเภสัชกรถึงร้อยละ 86.36 ผลลัพธ์ด้านเศรษฐศาสตร์ พบว่าสามารถลดค่าใช้จ่ายด้านยาจากปัญหาการสั่งยาซ้ำซ้อนและจ่ายมากเกินความจำเป็นได้ถึง 419,214.48 บาท มีอัตราส่วนของผลลัพธ์ต่อต้นทุนการให้บริการเป็น 2.45:1 ส่วนผลลัพธ์ด้านมนุษยธรรมพบว่า ผู้ตอบแบบสอบถามร้อยละ 95.20 จะแนะนำให้ญาติหรือเพื่อนที่มีปัญหาเกี่ยวกับการใช้ยามารับบริการที่ห้องบริบาลทางเภสัชกรรมในครั้งต่อไป

จากผลการศึกษาสามารถสรุปได้ว่าการให้บริบาลทางเภสัชกรรมสามารถช่วยลดปัญหาจากการใช้ยา และประหยัดค่าใช้จ่ายด้านยาได้ ดังนั้นจึงควรขยายการให้บริการงานบริบาลทางเภสัชกรรมไปสู่ผู้ป่วยกลุ่มอื่นๆ และเพื่อช่วยให้เกิดประสิทธิภาพในการใช้ทรัพยากรสุขภาพ