Introduction

We usually expect that the patients' diseases are curable when they are treated in the right way and with proper drugs. In fact, a lot of patients fail in those therapies because of noncompliance. Noncompliance is the invisible epidemic which causes the patients' death.[1] Noncompliance can occur at various stages of the medication-taking process. Initial noncompliance occurs when an individual seeks treatment from a health care provider and receives a prescription as a result, but never obtains the prescribed medication.[2,3] Berg et al. reported that there were 19-20% of patients per year who failed to have their prescriptions filled.[4]

Prescriptions that were filled and never claimed represent potential problems in patient care and cost-efficiency. When patients fail to communicate to their physicians that prescriptions were not filled or claimed at the pharmacy, the physician may make therapeutic decisions that are more costly and more complicated than what are necessary. For the pharmacy provider, unclaimed prescriptions contribute to increase inventory costs and labor cost (for filling the prescriptions and putting the medications back into stock) and the risk of mixing different medications in the same container.[5,6] Smith found that cost was a major factor in unclaimed prescriptions.[7] In contrast, Kirking and Kirking[8], who studied the unclaimed outpatient prescriptions at a university ambulatory care center, found that 64% of unclaimed prescriptions were new and 59% were covered by third parties. The findings from their studies suggest that the decision not to claim a prescription is more complicated than cost and convenience to the patient.

Objectives

The purposes of this study were:

1. To study the characteristics of unclaimed outpatient prescriptions at Songklanagarind Hospital; and
2. To assess the influence on unclaimed prescription of patient age, sex, diseases, drugs and cost of these prescriptions.
3. To examine patients' reasons for not claiming prescriptions.

Methods

Study site. Songklanagarind Hospital is a university hospital with 680 beds. The hospital service hours are 8.30 a.m. to 16.30 p.m. during official hours. The non-official services are 17.00 p.m. to 20.00 p.m. for weekdays and 9.00 a.m. to 12.00 a.m. at weekends. All patients, who come from local and distant places, use the pharmacy for prescription filling.

Study sample. Unclaimed prescriptions are the prescriptions which were filled in the outpatient pharmacy but the patients did not pick them up. After seven days these medicines are returned to stock. All unclaimed prescriptions at outpatient pharmacy filled between July 1 to October 31, 1997, were collected and analyzed.

Data collection. Data collection in this study were divided into two periods. All data regarding the individual patient and pharmacy were held in confidence.

The first period, the details of each unclaimed prescription are filled in the data collection form. The information collected were:

(1) the characteristic of each patient such as patient's name, hospital number, age, sex, address and home telephone number.

(2) prescription data such as prescription number; original date the prescription was filled; drug name, strength, route of administration and quantity; prescribing clinic; patient's disease; type of medication and prescription charge.

(3) out-patient pharmacy data such as number of all prescriptions per day in out-patient pharmacy, number of unclaimed prescriptions per day.

The second period, patients who did not pick up their prescriptions after 7 days from the filled date, were mailed a questionnaire at home by researcher to fill up the interview format. These patients were asked whether they were aware that the prescription were filled, the reasons for not picking up the prescription, patient's education and income. All questions were open-ended, with no response prompts in the questionnaire. Responses were categorized after the results were compiled at the end of the study period. If the unclaimed prescription had been dispensed, the patient was not interviewed.

Data analysis. Data gathered from the study were entered into SPSS/pc+ program for analysis. The characteristic of patients were described in percentage. The

factors associated with unclaimed prescription were tested with chi-square test. The priori level of significance was set at 0.05.

Results

1. Characteristics of unclaimed prescription patients

During the study period, 695 prescriptions were unclaimed, representing 0.67% of the total number of prescription filled. All unclaimed prescriptions were filled in the official period (Table 1). Major patients who did not claim their prescriptions were women (60.6%) , lived in Songkhla area (61.3%) and were private employees or civil servants (43.2%). The patients' age ranged from less than 1 year to 85 years. 53.6% of patients' age were between 16-45 years old (Table 2).

Table 1 Prescription type during the study period.

Prescription type	no. of unclaimed prescriptions	total prescriptions	percent of unclaimed prescriptions
in the official hours	695	93,448	0.74
out of official hours	-	9,836	-
total	695	103,284	0.67

Table 2 Characteristic of patients who did not claim their prescriptions.

characteristic	number	percent
sex		
female	421	60.6
male	274	39.4
address		
in Songkhla province	426	61.3
out of Songkhla province	269	38.7
age (years old)		
≤ 15	77	11.1
16 - 30	174	25.0
31 - 45	199	28.6
46 - 60	133	19.1
> 60	112	16.1
occupation		
employee	155	22.3
civil servant	145	20.9
agriculture	109	15.7
student	98	14.1
house wife	75	10.8
no occupation	66	9.5
business owner	47	6.8

2. Unclaimed prescription data

Prescriptions prescribed on Friday (Table 3) were less likely to be claimed than other days of the week. All prescriptions were claimed at weekends.

The rates of unclaimed prescriptions per total unclaimed prescriptions (Table 4) from the top five clinics were internal medicine clinic (20.1%); general medicine clinic (7.6%); surgery clinic (7.2%); orthopedic clinic (6.2%) and ear, nose, throat clinic

(6.2%). When the unclaimed prescriptions were classified by the international classification of diseases version 10 (ICD 10), the top five diseases often found were disease of the respiratory system (8.6%); disease of the musculoskeletal system and connective tissue (6.3%); disease of the genitourinary system (6.0%); disease of the digestive system (4.9%) and disease of the skin and subcutaneous tissue (4.7%) (Table 5).

Table 3 Rates of unclaimed prescription by days of the week.

days of the week	number	percent	total prescriptions	percent of total prescriptions
Monday	155	22.3	20,897	0.77
Tuesday	114	16.4	17,656	0.67
Wednesday	161	23.2	21,476	0.77
Thursday	90	12.9	17,689	0.53
Friday	175	25.2	19,243	0.95
Saturday	-	-	3,504	-
Sunday	-	-	2,819	-

Table 4 Rates of unclaimed prescription for diagnostic clinic.

Clinic	number	percent
Internal Medicine	140	20.1
General Medicine	53	7.6
Surgery	50	7.2
Orthopedics	43	6.2
Ear Nose Throat	43	6.2
Gynaecology	34	4.9
Pediatrics	33	4.7
Dermatology	36	5.2
Eye	30	4.3
Obstetrics	20	2.9
Psychiatry	18	2.6
Emergency	12	1.7
more than 1 clinic	8	1.2
no data	175	25.2
total	695	100.0

Table 5 Rates of unclaimed prescription by diseases of the patients.

diseases	number	percent
diseases of the respiratory system	60	8.6
diseases of the musculoskeletal system and connective tissue	44	6.3
diseases of the genitourinary system	42	6.0
diseases of the digestive system	34	4.9
diseases of the skin and subcutaneous tissue	33	4.7
more than one disease	30	4.3
diseases of the circulatory system	29	4.2
endocrine, nutritional and metabolic diseases	27	3.9
certain infectious and parasite diseases	22	3.2
symptoms, signs and abnormal clinical and laboratory finding, not elsewhere classified	19	2.7
mental and behavioural disorders	19	2.7
neoplasms	18	2.6
diseases of the eye and adnexa	18	2.6
pregnancy, childbirth and the puerperium	17	2.4
diseases of the ear and mastoid process	17	2.4
injury, poisoning and certain other consequences of external causes	9	1.3
diseases of the blood and blood-forming organs and certain disorders	9	1.3
diseases of the nervous system	8	1.2
no evidence of disease	3	0.4
congenital malformations, deformations and chromosomal abnormalities	2	0.3
factors influencing health status and contact with health services	2	0.3
no data	233	33.5
total	695	100.0

The unclaimed rate for acute and chronic diseases prescribing was shown in table 6. The acute and chronic diseases were classified by duration of treatment. Patient with acute disease could be curable in the short time such as catch a cold, eye rash, etc. But Patient with chronic disease must take his medicine for a long time such as diabetes mellitus, hypertention, etc. There were 68.1% in chronic diseases and 31.9% in acute diseases. However, the value of total acute diseases prescribing was 85.87% of total prescribing ones.

The prescribing items per prescription were ranged from 1 item to 10 items, with a mean ± S.D. of 2.285 ± 1.458. The mean ± S.D. of cost for one prescription was 581.97 ± 2,432.81 baht (Table7 and 8). Table 9 showed that essential drugs were more often dispensed than non-essential drugs but the cost of drugs was the opposite.

Table 6 Rates of unclaimed prescription classified by acute or chronic diseases

diseases	number	percent	value (baht)	percent of value
chronic	473	68.1	56,791.76	14.13
acute	222	31.9	345,035.23	85.87
total	695	100.0	401,826.99	100.0

Table 7 Number of items per unclaimed prescription

number of items per one prescription	number	percent
1	263	37.8
2	185	26.6
3	134	19.3
4	58	8.4
5	35	5.0
6	8	1.2
7	4	0.6
8	4	0.6
9	3	0.4
10	1	0.1
total	695	100.0

Table 8 Unclaimed prescription charge

Cost per prescription (baht)	number	percent
$\leq$ 50	236	34.0
51 - 100	127	18.3
101 - 500	204	29.4
501 - 1,000	53	7.6
$>$ 1,000	75	10.8
total	695	100.0

Table 9 Dispensed drugs classified by Thai National List of Essential Drugs 1993.

Dispensed drugs	number	percent	value (baht)	percent of value
essential drugs	897	56.5	154,314.09	38.4
non-essential drugs	691	43.5	247,512.90	61.6
Total	1,588	100.0	401,826.99	100.0

The rates of unclaimed prescriptions within general drug categories per total unclaimed prescriptions (n=695) were shown in table 10. Top three drug categories which often dispensed were neuro-muscular system (27.6%), respiratory system (10.3%) and dermatologicals (8.8%). But the value of each drug categories was different from the frequency of dispensing. Top three drug cost categories were chemotherapeutics (33.11%), cardiovascular drugs (19.80%) and neuro-muscular system (8.86%).

Table 10 Distribution of unclaimed prescriptions classified by drug categories.

drug categories	frequency of dispensed		value of drug	
	number	percent	baht	percent
neuro-muscular system	438	27.6	35,594.45	8.86
respiratory system	163	10.3	11,556.55	2.88
dermatologicals	139	8.8	11,874.31	2.96
vitamins and minerals	135	8.5	5,181.92	1.29
antibiotics	134	8.4	19,819.47	4.93
alimentary system	120	7.6	25,976.89	6.46
cardio-vascular system and diuretics	118	7.4	79,580.93	19.80
eye/ ear/ mouth/ throat	73	4.6	6,828.94	1.70
other chemotherapeutics	73	4.6	133,041.96	33.11
metabolism	71	4.5	18,886.37	4.70
allergy and immune system	67	4.2	14,321.57	3.56
hormones	34	2.1	9,373.86	2.33
genito-urinary system	9	0.6	20,567.16	5.12
nutritions	4	0.3	723.50	0.18
intraveneous and other sterile solutions	4	0.3	7,986.60	1.99
miscellaneous	4	0.3	365.60	0.09
contraceptive agents	2	0.1	146.91	0.04
total	1588	100.0	401,826.99	100.00

Paracetamol, triamcinolone, hydroxyzine and Obimin AF often found not be claimed in one item unclaimed prescription (Table 11) although the cost of them was not high. While Fugerel®, Indinavir® and Granocyte® were slightly dispensed but they were top three drug cost dispensed in unclaimed prescriptions (Table 12).

Table 11 Top five list of drugs in one item unclaimed prescriptions

drug name	frequency of dispensed	percent
Paracetamol 500 mg	28	10.6
Triamcinolone 0.1%	9	3.4
Hydroxyzine 10 mg	6	2.3
Obimin AF	6	2.3
Triamcinolone 0.02%	6	2.3
Ferro B Cal	5	1.9
Ibuprofen 400 mg	5	1.9
Naphcon E/D	5	1.9
Diazepam 2 mg	4	1.5
Diclocil 250 mg	4	1.5
Multivitamin	4	1.5
Norfloxacin 200 mg	4	1.5

Table 12 Top ten list of drug with high value in unclaimed prescriptions.

drug name	value of drug			frequency of dispensed		
	value(baht)	percent	cumulative percent	number	percent	cumulative percent
Fugerel 250 mg	46,026.27	11.5	11.5	5	0.3	0.3
Indinavir 400 mg	38,016.00	9.5	21.0	2	0.1	0.4
Granocyte 250 mg	28,347.20	7.1	28.1	1	0.1	0.5
Proscar 5 mg	20,403.00	5.1	33.2	6	0.4	0.9
Videx (ddI) 100 mg	15,504.30	3.9	37.1	2	0.1	1.0
Eprex 4,000 u	12,868.64	3.2	40.3	1	0.1	1.1
Zidovudine 100 mg	11,400.00	2.8	43.1	2	0.1	1.2
Sandimmune 25 mg	7,387.20	1.8	44.9	1	0.1	1.3
Losec 20 mg	7,109.00	1.8	46.7	3	0.2	1.5
Peritoneal dialysis solution	6,480.00	1.6	48.3	1	0.1	1.6

3. Patients' reasons for unclaimed prescriptions

After sending the questionnaires to all with unclaimed prescription patients, 152 of the 695 patients returned the questionnaires (response rate was 21.87%). The comparisons of characteristics between respondents and non-respondents was shown in table 13. There were no differences between respondents and non-respondents

Table 13 Comparison of respondents and non-respondents of unclaimed prescriptions

characteristics	respondents (%)	non-respondents (%)	p-value
sex			
female	87(57.2%)	334(61.5%)	0.34063
male	65(42.8%)	209(38.5%)	
address			
in Songkhla province	89(58.6%)	337(62.1%)	0.43228
out of Songkhla province	63(41.4%)	206(37.9%)	
age (years old)			
≤ 15	21(13.8%)	56(10.3%)	0.14405
16 - 30	40(26.3%)	134(24.7%)	
31 - 45	34(22.4%)	165(30.4%)	
46 - 60	36(23.7%)	97(17.9%)	
> 60	21(13.8%)	91(16.7%)	
occupation			
employee	26(17.1%)	129(23.7%)	0.16833
civil servant	42(27.6%)	103(19.0%)	
agriculter	28(18.4%)	81(14.9%)	
student	22(14.5%)	76(14.0%)	
house wife	13(8.6%)	62(11.4%)	
no occupation	14(9.2%)	52(9.6%)	
business owner	7(4.6%)	40(7.4%)	
time of hospital visit			
before noon	97(63.8%)	324(59.7%)	
afternoon	55(36.2%)	219(40.3%)	0.35506

Of 152 respondents, 61 respondents (40.13%) said that they had received their drugs later, so these questionnaires were excluded from this analysis. There were only 91 respondents (59.87%) included in the reasons why they did not claimtheir prescriptions.

The majority of respondents (76.9%) knew that they had a prescription to be picked up. The education level of respondents was shown in table 14. And respondents' income varied from no income to 50,000 baht per month. So, the mean of their income was 13,602.62 ± 54,124.33 baht per month.

Table 14 Characteristics of who gave reasons for not claiming their prescriptions (n = 91).

patient response	number	percent
aware of unclaimed prescription		
yes	70	76.9
no	21	23.1
education level		
no education	3	3.3
primary school	34	37.4
secondary school	6	6.6
high school	18	19.8
vocational	6	6.6
bachelor degree	20	22.0
more than bachelor degree	1	1.1
no answer	3	3.3
total	91	100.0

Most of the reasons patients gave for not claiming their prescriptions indicated that the patients had no money to pay for medication (22.0%). The next reasons were patients were very busy and they had no time waiting their medication (17.6%). 12.1 percent of patients did not remember situation involving prescription. Other reasons were reported by a modest number of patients, with a fairly even distribution (Table 15.)

Table 15 Patients' reasons for unclaimed prescriptions

reason	no.	percent
no money to pay for medication	20	22.0
patient did not remember situation involving prescription	11	12.1
patient was busy	10	11.0
physician or nurse did not told them about their medication	8	8.8
more than one reason	8	8.8
patient had no time to wait for medication	6	6.6
waiting time too long	5	5.5
patient did not tell the reason	5	5.5
old drugs were available	5	5.5
disease was not improved	3	3.3
patient forget medication which was filled in pharmacy	2	2.2
the illness was relieved	2	2.2
patient did not respect the physician	2	2.2
patient wanted to have physical examine only	1	1.1
physician poseponed the regimen	1	1.1
total	91	100.0

Discussion

This study showed the wide variety of factors associated with the unclaimed prescriptions. One of the most important factors seemed to be age. More than half of unclaimed patients were for working people who should be able to pay for their prescriptions. However, the majority of them were with low or no income such as student,

housewife, employee etc. So there probably was a risk factor that they might not claim their prescriptions.

The number of unclaimed prescriptions seemed to be depended on the number of total prescriptions per day. The traffic of prescription flow on Monday Wednesday and Friday was more obstruction with high volume prescriptions than on the other days of week, likewise the unclaimed prescriptions. In opposite, the prescription was not left in the pharmacy at weekends.

High percentage of unclaimed prescriptions came from internal medicine clinic (20.1%), general medicine clinic (7.6%) and surgery clinic (7.2%) respectively. These clinics associated with the diseases were diagnosed by the physicians.

The most noticeable group of unclaimed prescriptions were one item per prescription, using essential drugs and prescribing for acute disease. The drug cost per prescription was very fluctuation. It might be an association whether patients claimed their prescriptions. Too cheap prescriptions were probably made patients hesitate to claim. Beardon et al reported that the patients' confidence in the doctor was a factor which made they claimed or not.[9] The cheap one might consist of low quality drugs coordinating with the price. On the other hand, the expensive prescriptions might make patients refused to claim because of their financial problems.

More than a half of prescribed drugs in unclaimed prescriptions were drug prescribed for the symtomatic treatment such as neuro-muscular system, respiratory system, dermatological drugs. A survey conducted by the Upjohn company estimated that 51% of patients who failed to get a prescription filled believed they did not need the medication.[10] Patients might assume that acute conditions were self-limiting and would resolve on their own. Thus, the medications were ignored to be pickd up by these patients.

In this study, medications used for chronic disease state was higher than for acute disease state. When we considered the cost of drugs, the value of drugs used for acute disease state was higher than for chronic disease state about six times. Robbin reported that about 2% of people who brought prescriptions to the pharmacy never returned to pick them up; this translated into 40 million unclaimed prescriptions per year, or 1 billion dollars in unconsummated sale.[11]

One-fifth of dispensed drugs in unclaimed prescriptions was paracetamol. Paracetamol was an example of non-prescription drug which was usually available at home. Patients might use this drug from home or purchase it at another pharmacy near their home. Physicians should realize in this problem and might ask their patients about the drugs at home. Because a prescription which was failed to claim made both direct and indirect cost that we should not overlook. From the list of high drug value in Table12, we found that only first three items, which were slightly dispensed, costed approximately 25% of total unclaimed prescriptions value. These made inventory high stock than it should be. And they might be appeared when we put them back to the stock and probably found that these drugs were over stock. Thus, A question from physician for getting patient's information sometimes could save cost for patients and hospital. However, this study did not analyse the cost in prescribing drugs per prescription and this factor requires further study.

In the part of questionnaire, there was very low response rate (21.87%). So we compared and made chi-square test between respondents and non-respondents in each factor (Table 13). The major factors showed non-significant difference. There was only one factor that showed significant difference ($p<0.05$), which was patients' diseases. However, the majority of background information were not difference so we proceeded analysis in the next step.

The returned questionnaires from unclaimed patients showed that 40.3% of respondents had received their prescriptions later. It was possible that patients kept prescriptions for some of these agents until they were required rather than claimed them immediately. Thus, this evident might be appeared if we collected dispensed prescriptions for longer.

There were many reasons that patients did not claim their prescriptions (Table 15). The important ones possibly explained why patients did not claimed their prescriptions were they did not aware they had some drugs to claimed. It appeared 23.1% of respondents recorded that they did not know their medicines was filled in pharmacy. Davis suggested that the patterns of communication which deviated from the normative doctor-patient relationship would be associated with patients' failure to comply with doctors' advice.[12] The health care providers should realized the necessity of explanation to

their patients in this issue. Patient was not likely to simply return from the doctor's and take the medication that had been prescribed. It was more likely that the doctor's action and the drug he prescribed would be discussed and appraised.[13] Unclaimed prescriptions represented an obvious sign of therapeutic noncompliance. If we could reduce the number of unclaimed prescriptions which caused by patients' unawareness patient compliance would be increased.

In our studies, the financial impact was the most frequent answer than other reasons why the patients did not claim. According to Smith's research[14] which studied in New Zealand, he found that 6.9% of patients eligible for subsidy by government health care policies did not claim their prescriptions, compared with 11.2% of those not eligible. So the cost barriers, created by government subsidy condition, caused the increasing in unclaimed prescriptions. In our study, there was no record whether patients were subsidized by government or other insurance organizations. Thus, we could not summarize that the financial impact, a cause of unclaimed prescriptions, was created by subsidy system from those organizations.

However, there were other reasons that seemed to be important not less than the financial impact. Patients may not, for example, claimed their prescriptions when they were busy or no time for waiting the medicine. About 40% of unclaimed patients lived at the long distance from this hospital. They went to register in the morning and take a lot of time in the process of physical examination, labolatory test or other else. So it was probably explained that they were tired to wait for their medicine or there was some problems about transportation back home. Thus, they left their medicine in the pharmacy.

Unclaimed prescriptions were addressed as initial drug noncompliance. Every reason responded by patients were important and provided an unique opportunity for health care providers. When patients failed to claim their prescriptions, we should seek their reasons and tried to solve their problems discreetly. We could define the problems into two parts: the causes occurred in or out of pharmacy. The reasons which involved with the pharmacy, for example, a long waiting time for dispensing, pharmacy staffs should improve their service to reach patients' satisfaction. If patients failed to pick up their drug by unawareness or other else, telephone contact or sending a postcard to them should be used. These strategies might reduce the volume of unclaimed prescriptions. Kubota et al

reported that after they used telephone to contact their patients who did not claimed their drugs, the numbers of unclaimed prescriptions were reduced about 70%.[15] In addition, Kazmierczak brought the reminding system by sending out a postcard to these patients. After he used this method for two years, half of the patients who were sent cards actually came back to pick up their prescriptions.[16]

However, the first step which patients made decision to claim or not was the communication between patients and health care providers. There were many researches supported this issue.[17,18] Patients must be convinced that the medications would of some benefit to them. And pharmacists or other health care providers should tell them why it was important to take their medicine continually. After the patients were educated, they became more interested in taking their drugs correctly and their illness must be improved.

Conclusion

Our study found that there were many factors associated with unclaimed prescriptions. Perhaps the cameo of patients least likely to claim a prescription was women, ill with chronic disease and was prescribed by internal medicine physician and be impacted by cost barrier.

Our study was carried out in only one hospital and thus might not be generally represented to another health centers in unclaimed prescriptions. In addition, there were many factors which were important such as patients' behavior, source of payment, side effect from drug utilization, cost-effective which influenced patient's decision making for claiming their prescriptions or not. These were not studied in this research. In the further research, cost-effective scheme should be evaluated to show the impact from unclaimed prescriptions. The strategy for improving patient's claiming prescription must be intervened and then evaluated to find out the best method for increasing patient compliance.

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