Factors Associated with Direct Non-medical Costs of Outpatients in the Community Hospital and Health Promoting Hospitals in Kokha District: a Cross-sectional Survey

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Abstract

Objective: Information about direct non-medical costs (DNMc) is an important element to enable providers to account for the financial burden from the patient's side. However, availability of data on DNMc to use in real practice is rather limited. This study aimed to assess the DNMc and their associated factors of outpatients at a community hospital (CH) and the health promoting hospitals (HPHs) in Kokha District.

Methods: This cross-sectional study included patients from the outpatient department of CH and 12 HPHs in Kokha District from November 2018 to January 2019. Data about demographic characteristics and DNMc, including costs of transportation, productivity loss, and costs of food and accommodation, were collected by face-to-face interviews, using 2018 as the base year.

Results: A total of 441 patients, 221 from CH and 220 from HPHs, were male 220 patients, female 250 patients. The average age was 50-69 years. The average total DNMCs of patients at HPHs was 73.79 Baht, significantly less than for patients at CH, 371.86 Baht. Moreover, the average total DNMc of the caregivers at HPHs was 63.74 Baht, significantly less than for patients at CH, 232.59 Baht. Approximately 49.1% of patients at CH had caregivers, compared with 24.9% of those at HPHs; the difference in the proportion of caregivers is particularly prominent among those aged 50-69.

Conclusions: The DNMc and proportion of caregivers for patients at the CH were more than those at the HPHs.

Keywords: direct non-medical costs, outpatient, community hospital, health promotion hospital

การศึกษาปัจจัยที่มีผลกับต้นทุนทางตรงที่ไม่เกี่ยวกับการแพทย์ของผู้ป่วยนอกโรงพยาบาลชุมชน และโรงพยาบาลส่งเสริมสุขภาพตำบล ในเขตรับผิดชอบ อำเภอเกาะคา จังหวัดลำปาง: การศึกษาแบบตัดขวาง

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บทคัดย่อ

วัตถุประสงค์: ข้อมูลเกี่ยวกับต้นทุนทางตรงที่ไม่เกี่ยวกับการแพทย์เป็นองค์ประกอบสำคัญที่สามารถช่วยผู้ให้บริการทางการแพทย์ทราบถึงภาระทางการเงินของผู้ป่วยได้ แต่ข้อมูลที่มีเกี่ยวกับต้นทุนทางตรงที่ไม่เกี่ยวกับการแพทย์สำหรับใช้ในทางปฏิบัติยังมีค่อนข้างจำกัด การศึกษานี้มีวัตถุประสงค์เพื่อประเมินต้นทุนทางตรงที่ไม่เกี่ยวกับการแพทย์และปัจจัยที่เกี่ยวข้องของผู้ป่วยนอกในโรงพยาบาลชุมชน (รพช.) และโรงพยาบาลส่งเสริมสุขภาพตำบล (รพ.สต.) ในอำเภอเกาะคา

วิธีดำเนินการวิจัย: การศึกษาแบบภาคตัดขวางนี้เลือกผู้เข้าร่วมวิจัยจากผู้ป่วยนอกที่มารับบริการที่ รพช. และ รพ.สต. ทั้ง 12 แห่ง ในอำเภอเกาะคา ระหว่างเดือนพฤศจิกายน พ.ศ. 2561 – มกราคม พ.ศ. 2562 โดยเก็บข้อมูลทั่วไปและต้นทุนทางตรงที่ไม่เกี่ยวกับการแพทย์ ได้แก่ ค่าเดินทาง ค่าเสียเวลา ค่าอาหาร และค่าที่พัก จากการสัมภาษณ์โดยใช้ปี พ.ศ.2561 เป็นปีฐาน

ผลการวิจัย: ผู้เข้าร่วมวิจัยทั้งหมด 441 คน จาก รพช. 221 คน และ รพ.สต. 220 คน เป็นเพศชาย 191 คน เพศหญิง 250 คน ช่วงอายุเฉลี่ย 50-69 ปี ต้นทุนทางตรงที่ไม่เกี่ยวกับการแพทย์เฉลี่ยของของผู้ป่วยที่ รพ.สต. เท่ากับ 73.79 บาท ซึ่งน้อยกว่าของผู้ป่วยที่ รพช. เท่ากับ 371.86 บาท ยิ่งไปกว่านั้น ต้นทุนทางตรงที่ไม่เกี่ยวกับการแพทย์เฉลี่ยของผู้ดูแลที่ รพ.สต. เท่ากับ 63.74 บาท ซึ่งน้อยกว่าของผู้ดูแลที่ รพช. เท่ากับ 232.59 บาท ร้อยละ 49.1 ของผู้ป่วยที่มารับบริการที่ รพช. มีญาติหรือผู้ดูแล เมื่อเปรียบเทียบกับผู้รับบริการที่ รพ.สต. ที่มีจำนวนเท่ากับร้อยละ 24.9 เท่านั้น ความแตกต่างในสัดส่วนของผู้ดูแลมีความเด่นชัดขึ้นในกลุ่มผู้ป่วยช่วงอายุ 50-69 ปี

สรุป: ต้นทุนทางตรงที่ไม่เกี่ยวกับการแพทย์และสัดส่วนของผู้ดูแลของผู้ป่วยที่รับบริการที่ รพช. มากกว่าผู้ป่วยที่รับบริการที่ รพ.สต.

Introduction

Direct non-medical costs (DNMc) are financial burdens incurred by patients when they receive medical services[1-4]. DNMc are often seen as a financial barrier not only to healthcare access, but also treatment adherence[8,9]. DNMc include the costs of transportation, food, accommodation and productivity loss for both the patients and their caregivers[1,2].

Although information about DNMc is an important element to enable providers to account for the financial burden from the patient's side, availability of data on DNMc to use in real practice is rather limited[5]. For example, a study in Thailand investigated the direct non-medical costs for health care seekers at an outpatient department compared with primary care units (PCUs). They found that "The DNMc of patients at the PCUs, 76.7 Baht, was significantly lower than for patients at the hospital, 585.6 Baht"[5]. A study the Standard Cost Lists for Health Economic Evaluation in Thailand, they interviewed 900 patients in six PCUs, three community hospitals, and three provincial/ regional hospitals. The results showed that the DNMc for outpatients per visit, sorted by community hospitals and provincial/ regional hospitals, respectively, were: 1) time spent to receive service including traveling (from and to home) (min) 175 and 361; 2) costs of transportation (Baht) 72.33 and 142.55; 3) costs of food (Baht) 26.23 and 52.51; 4) productivity loss of the patient (Baht) 49.07 and 80.29; and 5) productivity loss of the caregiver (Baht) 43.52 and 95.51[6]. A study of palliative pediatric cancer caregivers showed that the costs of the caregiver's productivity loss and food were 180 Baht and 20 Baht, respectively, for each hospital visit, whereas the patient costs of food and transportation were 22 Baht and 54 Baht, respectively[7].

Financial information that providers take into account when making clinical decisions usually includes only the direct medical costs, which may not be sufficient to promote patient-centered care plans. Moreover, DNMc are also crucial when performing a cost-effectiveness analysis from the patients' and societal perspectives[4].

Despite its importance, information about DNMc is still lacking, especially in Thailand. This study aimed to assess the DNMc of outpatients in the community hospital (CH) and the health promoting hospitals (HPHs) in Kokha District, and also explored factors associated with DNMc of patients.

Methods

The study design is a cross-sectional survey. This study included patients from the outpatient department of CH and 12 HPHs in Kokha District from November 2018 to January 2019. The samples were excluded if: 1) the patient was hospitalized after visiting the physician; 2) the patient was treated at the emergency room; 3) the patient did not consent to participate; or 4) the patient did not live in Kokha District. Convenience sampling was used for sample selection, with consideration given to a variety of genders, ages, and healthcare settings.

The sample size of this study was calculated using Taro Yamane's formula[10].

$$n = \frac{N}{1 + Ne^2}$$

From the administration data at Kokha in 2017, the total number of outpatients receiving medical service in Kokha (including Kokha Hospital and HPHs) was 84,647 patinets per year. Thus the sample size is approximated to be 398 patients. Owing to the possible loss of samples for any reasons, such as dropouts or those who do not complete the questionnaire, a conservative rate of 11% (42 participants) is applied to estimate the additional inclusive samples in the study to cover the losses. So, a total sample size for the study was 442 participants.

DNMc of patients and caregivers in this study comprise the costs of transportation, costs/ productivity loss, and costs of food and accommodation. All DNMc were estimated using 2018 as the base year.

Costs of transportation were defined as the total transportation costs incurred as a result of the patient receiving medical care. Depending upon the

mode of transport used, two methods were applied for the cost estimation: 1) The cost of transportation was approximated as the amount of money that was actually paid for transportation if the transportation costs to/from the hospitals were paid in a lump-sum; 2) The cost of transportation was calculated by the round trip distance from the residence to the hospital (in kilometer) multiplied by the costs of transport, which depended on the types of vehicles: 4 Baht per kilometer when a car was used[13] and 2 Baht per kilometer when a motorcycle was used[13].

Costs/productivity loss of the patient and caregiver were defined as the monetary value of time lost as a result of receiving medical services. These costs of caregivers were calculated based on 2 scenarios: caregivers being employed or not employed.

In the case that a caregiver was employed, costs/productivity loss were obtained from an interview to establish the actual wage/ hiring rate of the caregivers. Concerning unemployment, the productivity loss of a caregiver who was not employed was calculated from the overall time spent in accompanying a patient from their residence to the hospital and back. A human capital approach[4] was used to estimate the wage, by valuing time spent in a monetary unit using the wage per time in the labor market. Estimation of the wage per hour rate followed the act of the Ministry of Labor. According to the act, a working day of 8 hours[15] with a minimum wage of 310 Baht per day was indicated in Lampang[14].

Total time lost by a caregiver was calculated as (time spent from the patients' residence to the hospital and the hospital to the patients' residence (in minutes) plus the total time spent at the hospital (in minutes). Costs of food and accommodation were calculated by interviewing the patients and their caregivers for the actual expenses incurred.

Factors including gender, age, reason for hospital visit, and the number of caregivers were collected to use in the analysis. A Chi-squared test was employed to explore the association between categorical variables. An analysis of variance (ANOVA) and t-test were applied to examine the associations between the direct non-medical costs and other covariates. An alpha of 0.05 indicated a level of significance. Stata version 13 was used in the analysis[11].

Results

A total of 441 samples were interviewed, 220 and 221 from CH and HPHs in Kokha District, respectively. The majority of samples were at the age of 60 or above. It is seen that 49.1% of patients from CH had a caregiver, whereas only 24.9% from HPHs were accompanied by their caregivers, as shown in Table 1.

Table 2 shows the direct non-medical costs of patients, by HPHs and CH. As demonstrated, the average distances from home to hospitals are significantly different among patients receiving care at CH (7.26 km) and HPHs (1.88 km). The total time spent for receiving services at CH was 3.61 hours less than those at the HPHs. The total DNMCs of patients at HPHs was 73.79 Baht, significantly less than for patients at CH, 371.86 Baht. It is noted that there were no incurred costs of accommodation in either group.

It can be seen from the results that a higher proportion of patients at CH had caregivers, compared with those at HPHs; the difference in the proportion of caregivers is particularly prominent among those aged 50-69, as seen in Table 3. Further, the difference in the presence of caregivers between the healthcare settings is associated with illnesses. In addition, the difference in the proportion of patients having caregivers is essentially pronounced among female patients, compared with their male counterparts.

Concerning the DNMc of the caregivers, the evidence reveals that the total time spent for receiving services at CH was higher than that at HPHs (4.15 hours and 1.23 hours, respectively). Moreover, the average total DNMc of the caregivers at CH was 168.85 Baht more than that at the HPHs.

Table 1:

Demographic characteristics of the samples

Characteristics	N (%)	
	CH	HPHs
Total	220	221
Sex		
Male	98 (44.5%)	93 (42.1%)
Female	122 (55.5%)	128 (57.9%)
Age groups (years)		
< 15	18 (8.2%)	2 (0.9%)
15-49	50 (22.7%)	39 (17.6%)
50-69	98 (44.5%)	134 (60.6%)
≥ 70	54 (24.5%)	46 (20.8%)
Number of caregivers		
0	112 (50.9%)	166 (75.1%)
1	93 (42.3%)	54 (24.4%)
> 1	15 (6.8%)	1 (0.5%)
Reasons for hospital visit		
Acute illness	119 (54.1%)	104 (47.1%)
Chronic diseases	101 (45.9%)	117 (52.9%)

Table 2:

Information for direct non-medical costs

Factors	Mean (SD)		Difference	p-value
	CH	HPHs		
Distance from the residence to the hospital (km)	7.26	1.88	5.38	<0.001
Duration of transportation from home-hospital (min)	22.96	11.33	11.63	<0.001
Duration of hospital visit (min)	246.75	53.64	193.11	<0.001
Total time spent to receive service including traveling (hour)	4.88	1.27	3.61	<0.001
Costs of transportation (Baht)	50.65	8.66	41.99	<0.001
Productivity loss of the patient (Baht)	190.83	49.27	141.56	<0.001
Costs of food (Baht)	16.19	0	16.19	<0.001
Total DNMCs of patients side (Baht)	257.67	57.93	199.74	<0.001
Costs of informal caregivers (Baht)	114.19	15.86	98.33	<0.001
Total DNMCs of patients (Baht)	371.86	73.79	298.07	<0.001

Table 3:

Characteristic and information of caregivers

Factors	Number (Percentage)		p-value
	CH	HPHs	
Presence of caregivers (N, %)	108 (49.1%)	55 (24.9%)	< 0.001
Sex			
Male	38 (61.3%)	24 (38.7%)	0.064
Female	70 (69.3%)	31 (30.7%)	< 0.001
Number of caregivers by age groups (N, %)			
< 15	18 (100%)	2 (100%)	-
15-49	17 (34%)	8 (20.5%)	0.235
50-69	46 (46.9%)	21 (15.7%)	< 0.001
≥ 70	27 (50%)	24 (52.2%)	0.844
Reasons for hospital visit of patients			
Acute illness	62 (71.3%)	25 (28.7%)	< 0.001
Chronic diseases	46 (60.5%)	30 (39.5%)	0.003

Table 4:

Costs of informal caregivers

Factors	Mean (SD)		Difference	p-value
	CH	HPH		
Distance from the residence to the hospital (km)	7.97	2.63	5.34	< 0.001
Duration of transportation from home-hospital (min)	24.63	12.87	11.76	< 0.001
Duration of hospital visit (hour)	3.33	0.80	2.53	< 0.001
Total time spent to receive service including traveling (hour)	4.15	1.23	2.92	< 0.001
Costs of transportation	57.44	15.94	41.5	< 0.001
Productivity loss of the patient	160.71	47.8	112.91	< 0.001
Costs of food	14.44	0	14.44	< 0.001
Total costs of each caregiver	232.59	63.74	168.85	< 0.001

Discussion

Results of this study show that DNMc of patients at the HPHs is significantly lower than those who went to the community hospital. The main components where the cost differences were incurred are travel distance and time spent at the hospitals. This study also illustrated that approximately half of the patients who visited the community hospital had caregivers, whereas only a quarter of the patients at HPHs had caregivers. This difference is highlighted among patients between the ages of 50 and 69, where the difference in the presence of caregivers between the 2 settings is about 31%. As the need for caregivers may, in part, become a barrier for healthcare access, healthcare administrators may consider focusing on increasing

the availability of care at the HPH, especially for those aged 50-69. This attempt could not only reduce the productivity loss of caregivers, but it may also promote patients' access to medical services.

Concerning the incurred costs for caregivers who accompanied the patients, this study quantified the cost reduction of 168 Baht for caregivers at the HPHs compared with the community hospital. This study collected data from one community hospital and 12 HPHs in one district of northern Thailand. Further studies collecting data from other community hospitals and HPHs are suggested to validate the DNMc. When comparing the DNMc across studies, marked differences in DNMc reported are observed [5-9]. This could possibly be explained by geographical variations across different regions. Therefore, it is crucial to note that applying the DNMc information from existing literature in general use may represent the costs only to some extent. However, studies about DNMc in particular settings are highly recommended when the accuracy of the cost information is of concern.

These results concur with those reported from previous research[5-6]. Information from this research can be used as input to redesign the health system to reduce travel distance and time spent at the hospitals which would result in a decrease of the financial barrier from the patient's side. A strategy to help decrease DNMc is to identify uncomplicated patients with chronic diseases who receive services at the community hospital, and whose medical management can be delivered within the capacity of HPHs. Healthcare administrators might target these groups to be referred back to the HPHs, as this will help reduce time spent and subsequent DNMc to access healthcare. Despite existing obstacles from DNMc as a barrier, it may be inevitable for some patients to visit the community hospital due to the complexity of their diseases which require high-cost medications, extensive investigation, and personnel expertise. One way to relieve this situation, could be if administrators consider increasing the service capacity at HPHs such as availability of practitioners, types of drugs, and venipuncture for laboratory investigations. Additionally, provision of staff training to perform minimally invasive procedures, such as incision and drainage, may be considered to build up capacity to hold a more extensive variety of cases with higher complexity at HPHs. This would enable patients to receive services at their local HPHs, resulting in the reduction of travel distance and time spent at the hospitals.

In 2016, the Ministry of Public Health launched a policy to increase the capacity of the primary care units, including HPHs, to become Primary Care Clusters (PCC). An aim of PCCs is to enhance the capability of the primary healthcare settings to become the first site for all patients[12]. Improving the quality of the primary setting would bring about a reduction of DNMc, which is inclined to promote healthcare utilization as a consequence.

Patients included in this study came from general patients at the OPD. DNMc from this study may not represent some patients with particular characteristics such as stroke, Parkinson's, wheelchair-bound or bedridden patients who require special assistance, thus increasing DNMc. In assessing the financial barrier of these specific patients, future research may be needed to obtain the DNMc of these groups to gain a better understanding of this issue.

One factor that might impact the DNMc results is the seasonal variations which could potentially influence difficulty with transport. This study was conducted during winter, when there are no particular obstacles to transportation, compared with traveling during the rainy season, when the costs of transport may be higher. However, this is out of the scope of this study, which leaves the exploration of this cost for future research.

Another limitation in data collection is due to the fact that, in calculating DNMc, this study collected the duration of patients' transportation from patients' self-reported information. Pertaining to this, uncertainty resulting from the recall bias affecting the reported time spent during travel arises, as patients may give the interviewer different transportation times even when the distance and mode of transportation are about the same. This is acknowledged as a limitation of the study.

This study exhibits that time spent at the community hospital, which is the sum of all activities along the patients' journey in the hospital, is among the major factors contributing to the high DNMc. Details about the process of each activity along the patients' journey could be used in a workflow analysis to redesign the system to minimize time

spent at the hospital. However, exploring this information is beyond the scope of this study. Future research, exploring the time spent at each point of the patient's journey may be beneficial as an input to inform hospital administrators and help to devise interventions to reduce time spent. This could also result in a reduction of the DNMc of the patients.

Another issue worth mentioning is the lack of studies assessing the DNMc of the out-patients. It is seen that existing research about DNMc in Thailand were conducted in central/regional hospitals, community hospitals and HPHs[5-6]. There remains knowledge gaps about DNMc in other healthcare settings such as medical schools and private hospitals, which leaves the opportunity to examine these in future research.

Conclusions

Results from this study reveal the DNMc of outpatients in the Community Hospital and Health Promoting Hospitals in Kokha District and show that the DNMc at the Community Hospital were higher than at HPHs. The major component of DNMc was found to be the travel distance and time spent at the hospitals. Improvement of service capacities at primary care settings can be helpful in designing service plans to reduce the financial barrier from the patient's side.

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