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Original Article

Utilization of Emergency Department in Patients With Non-urgent Medical Problems: Patient Preference and Emergency Department Convenience

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Background/Purpose: We investigated the factors associated with emergency department (ED) use among patients with non-urgent medical problems, with a focus on convenience and preference to use the ED instead of primary care clinics.

Methods: A five-level triage system was adopted by research nurses to decide each patient's triage level and the maximum time to physician interview. Patients who had a maximum time to physician interview of more than 60 minutes were assumed to be non-urgent in this study.

Results: More than half of ED visits were considered to be non-urgent. Non-urgent patients were more likely to be unmarried, government employees, visit the ED due to trauma, have a history of chronic illness, and present in the day time or at the weekend. ED visits were also more likely to occur in patients who took less than 15 minutes to reach the ED, chose the ED for its convenience, agreed that they could have chosen another facility for their visit, did not agree that the ED was convenient for receiving medical care. Multivariate logistic regression showed that marital status, time of presentation, time needed to get to the ED, and occupation were associated with non-urgent ED visits.

Conclusions: Preference for using EDs for medical care and their convenience might contribute to non-urgent ED visits. A five-level triage system reliably stratified patients with different admission rates and utilization of medical resources, and could be helpful for reserving limited medical resources for more urgent patients.

Key Words: convenience, emergency department, non-urgent cases, patient preference

The use of hospital emergency departments (EDs) by patients with non-urgent problems has long been seen in the United States and in other countries. Because of the variable definition of non-urgent cases in the literature, the reported number of non-urgent patients attending EDs has varied greatly from 5% to 82%.[1] However, in general, about half of ED visits are for non-urgent

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cases.[2,3] Treatment of patients with non-urgent problems in the ED could impose higher costs and medical expenses, and increase the workload on an overcrowded department. Continuity of care could also be compromised when patients choose an ED rather than other primary care settings, especially for patients with a chronic illness or those who need preventive strategies.[4]

Many factors can cause patients with non-urgent medical problems to visit the ED rather than a primary care facility. Among the most commonly discussed is the problem of accessibility to primary care. Shesser et al found that the three major reasons for ED use by patients with minor illness are: absence of a previous provider relationship; inability to make a prompt appointment with their regular provider; and convenience of the ED.[5] Similar results have been found by other authors. Sarver et al found that dissatisfaction with the usual source of care and its staff, lack of confidence in the ability of the usual source of care , difficulty in scheduling an appointment and reaching the usual source of care by telephone, and long waiting times for an appointment are all associated with non-urgent ED visits.[6] The lack of a regular source of care is assumed to be due to poor insurance coverage. Uninsured Americans receive only half the care of their insured counterparts,[7] and low-income and ethnic minority patients, who are usually uninsured, can face formidable barriers to care.[8,9] The argument for rationing ED care as a safety net for those who have no access to health care coverage reflects the general belief that uninsured people account for the problems of non-urgent ED visits.[10,11] Besides problems of accessibility, there are other reasons that are given by non-urgent patients who choose the ED for their care. According to Howard and colleagues, one of the reasons that people use the ED for non-urgent medical care is that it takes less of their time to be seen in the ED than it does to contact their primary care physician.[12] Other research has found that non-urgent patients choose the ED because they live close to it,[13,14] and they believe that it is quicker to be seen in the ED,[12–14] and that it is more convenient.[5,15]

However, one unanswered question is whether poor accessibility to primary care pushes patients in the direction of the ED, or if it is the convenience and other characteristics of the ED that attract non-urgent patients. In addition, there are very few reports in the literature about the pattern of use of EDs by non-urgent patients in areas where there is little problem with accessibility to primary care. Taiwan implemented National Health Insurance (NHI) in 1995, and >90% of residents are covered. There is little problem of accessibility to primary care, except in certain rural areas of high altitude. We conducted a study to establish the factors associated with ED use among patients with non-urgent medical problems, with a focus on convenience and preference for using an ED instead of primary care clinics.

Methods

Settings

This study was conducted in an ED of a tertiary care hospital located in a suburb of Taichung city in central Taiwan. There are 33 hospitals with 5000 acute care beds and more than 1600 clinics, which serve one million people in Taichung city. The pre-hospital time (from call to arrival at the hospital) in the emergency medical services system of this community is 16.8 minutes on average, and 26 minutes at the 90th percentile (unpublished data). Full-time emergency physicians staff this ED. Historically it has served approximately 50,000 patients annually, which accounts for one-eighth of the ED volume in this community. This ED has an admission rate of 25%, which accounts for 45% of the admissions to this hospital. There is little overcrowding in this ED. Patients usually only wait 8.5 minutes to be seen by an emergency physician, and stay in the ED for an average of 3.2 hours. NHI covers more than 94% of people in Taiwan. Patients seeking emergency medical care in primary, secondary and tertiary referral hospitals are charged a fixed copayment of NT$150, NT$300 and NT$450, respectively. The average copayment (about US$10), which accounts for

16% of ED medical expenses on average, and about 3–9 times the amount that they pay to a primary care physician, is a flat amount paid for each ED visit to the hospital. In the area where this ED is located, there are at least 20 primary care clinics that are situated less than 15 minutes from the ED, and most are open from 9:00 to 21:00 hours, Monday to Saturday.

Questionnaire

We developed a structured questionnaire according to the factors associated with non-urgent attendance at the ED. The content included: demographic data (age, sex, education, marital status, and occupation); reasons to choose the ED (trauma *vs*. non-trauma); self-reported health status and presence of chronic illness; time needed to get to the ED; perception about the urgency of the visit; and attitudes toward the convenience of the ED. Questions that inquired about the preference to use the ED and attitudes towards its convenience are listed in Table 1. For patients who were less than 14 years old, comatose, or too critically ill to answer, their family members or the friends/colleagues who accompanied the patient (potential decision makers) were asked to answers the questions about attitudes and preferences. However, the patient was required to provide information about their demographic data, health condition and presence of chronic illness. For patients aged less than 14 years old, answers on marital status, education, and occupation were from the family who answered the questionnaire. We ask five experienced emergency physicians and emergency nurses from other teaching hospitals or academic medical centers to validate the contents of the questionnaire. We performed a pilot test and recruited 20 patients to answer the questionnaires, and accordingly modified the wording of the questions before formally implementing the study.

Table 1. Questions inquiring about the attitudes toward convenience and preference to emergency department

- Factors associated with conveniences
  - How much time did you take coming to this ED?
  - Check the reasons why you choose this ED for care? (multiple choice)
    - * Recommended by the referred facility
    - * Old medical record in this hospital
    - * ED is more convenient for me
    - * Appropriate for emergent care
  - Do you agree that ED is a convenient place to receive medical care?
  - Day of presentation per week?
  - Time of presentation per day?
- Preference to ED
  - Can your condition possibly be treated in clinic or outpatient setting?
    - ("exclusively need ED" or "could choose other facility")

ED = Emergency department.

Data collection

All consecutive emergency patients who visited the ED from October 28 to November 3, 2005 were enrolled. Five experienced emergency nurses were recruited as research nurses after 4 hours of instruction. They took all shifts of the 7-day study period as their times of convenience. The research nurses gave all patients (or respondents) the questionnaire after they registered, regardless of the time of arrival and urgency of a patient's visit. The research nurses followed the respondents during their ED stay; helping them to fill in the questionnaires and collecting the questionnaires before the patient left the ED. From a retrospective chart review after each visit, the research nurses recorded the date and time of arrival, chief complaints, vital signs, and other emergency evaluations done by the triage nurse, and determined the reason for the ED visit (trauma *vs*. non-trauma), and the urgency of the patients according to the rules described below. The research nurses also recorded the examinations, medical procedures, medical management, and disposition of the patients. The research nurses were required not to interfere with the medical care and clinical procedures. They were also instructed to prevent unrelated persons from retrieving any information about the study material. This study was approved by the Institutional Review Board.

With reference to the Canadian Emergency Department Triage and Acuity Scale (CTAS),[16] we developed a local triage system with a total of five levels of acuity (New Acuity Scale 1–5, or N1–N5). As designated in the CTAS, each acuity level in our system was assigned a maximum time before an interview with a physician, which were 0, 15, 30, 60, and 120 minutes for N1–N5 levels, respectively. The research nurses decided the new triage level according to the chief complaint, vital signs, and other parameters of the patients. The triages were done independently from the on-duty triage nurse. The patients who were determined to have maximum times before an interview with a physician of 60 and 120 minutes (N4 and N5 levels, respectively) were assumed to be non-urgent.

Data analysis

All data were managed and analyzed using the SPSS version 10.0 (SPSS Inc., Chicago, IL, USA). A frequency distribution was used to describe the demographic characteristics and the distribution of each variable. To determine the differences in proportions between groups for each variable, χ^2 tests were used. Student's t tests were used to determine the differences between continuous variables. Only those variables with statistically significant differences were entered into multivariate logistic regression analysis. A p value < 0.05 was considered to be significant. To validate the ability of the New Acuity Scale system to differentiate levels of acuity, we compared the odds of admission rate and utilization of high medical resources (≥ 3 items) for each acuity level, using acuity level 3 as the reference. Medical resources included pharmacy prescription, drug/fluid injections, laboratory examinations, imaging, medical procedures, and consultations. Multiple items in each class were counted once only.

Results

Among a total of 898 ED patients in this 1-week study period, 759 (84.5%) completed the questionnaires and were enrolled. The male to female ratio was 1.12, and the mean age was 37.4 ± 21.5 years. Eighty-nine patients (11.7%) were < 14 years old. Three hundred and ninety-five patients (52.0%) were classified by the research nurses to be non-urgent. About one third of the respondents visited the ED for trauma or intoxication, and 198 (26.1%) were reported to have chronic illnesses. Most of our patients (621, 92.0%) were self-referred, whereas 44 (6.5%) and 10 (1.5%) were referred through ambulance or ambulatory care, respectively. About half of the patients (362, 47.7%) visited the ED during the day time (08:00–18:00 hours), and a total of 255 (33.6%) visited during the weekend. The majority (663/747, 88.6%) of the patients took less than 30 minutes coming to the ED, and 300 (380/747, 50.9%) took only 15 minutes. More than half (411/759, 54.2%) of the respondents cited appropriateness as their reason for choosing to visit the ED. Other reasons included previous medical records (270/759, 35.6%), convenience of ED (149/759, 19.6%), or referral by other medical facilities or emergency medical services. Most (551/727, 75.8%) of our respondents perceived that the ED was convenient for their medical care, and half (402/730, 55.1%) of them thought that they exclusively needed ED care for this visit. Patients with non-urgent problems presented to the ED with a diurnal pattern, which peaked between 08:00 and 18:00 hours, and tended to surge on Saturday or Sunday. This diurnal change was more apparent in non-urgent visits due to trauma (Figure).

Bivariate analysis (Table 2) revealed that non-urgent patients were more likely to be unmarried, government employees, visit the ED due to trauma, have a history of chronic illness, and present during day time (08:00–18:00 hours) or at the weekend. ED visits were also more likely to occur in patients who required < 15 minutes to get to the ED, chose the ED for its convenience, agreed that they could have chosen an alternative facility for their visit, and did not agree that the ED was convenient for receiving medical care. Using a multivariate logistic regression model, we found that the independent factors that were associated with a non-urgent ED visit were marital

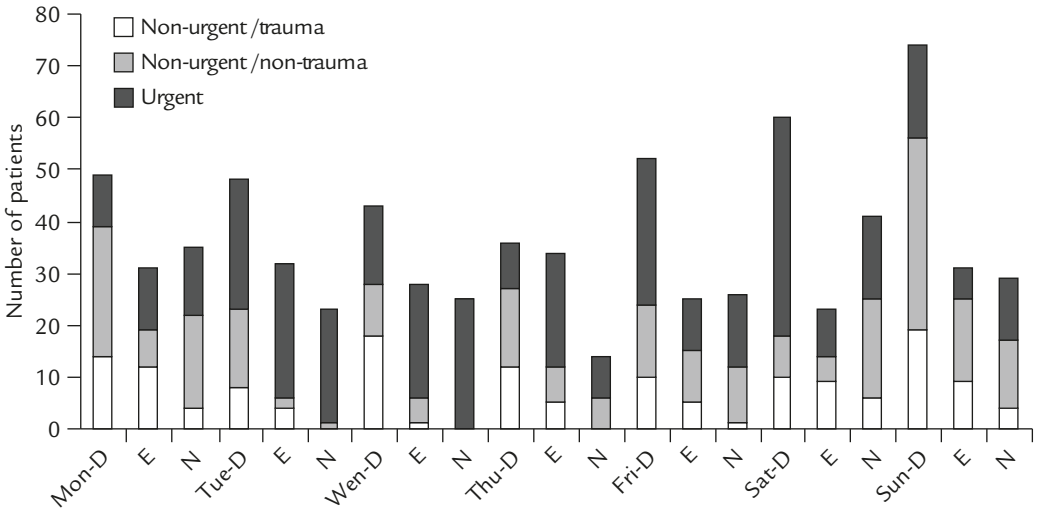

Figure. Diurnal change of urgent and non-urgent (trauma and non-trauma) patients in different shifts in a week. D = 08:00–18:00 hours; E = 18:00–00:00 hours; N = 00:00–08:00 hours.

status [odds ratio (OR) = 1.55 for unmarried], time of presentation (OR = 1.93 for patients who visited the ED between 08:00 and 18:00 hours), and time needed to come to the ED (OR = 1.46 for those arriving in < 15 minutes). Agricultural workers were 0.25 times as likely as government employees to have non-urgent ED visits [95% confidence interval (CI) = 0.08–0.75]; however, the overall association of occupation with urgency of ED visits was not statistically significant. Although they were not statistically significant associations, non-urgent ED visits tended to occur in patients who presented at the weekend, and in those who could choose other facilities for their care (Table 3).

Compared to level 3, the New Acuity Scale levels 1 and 2 patients had a 16 (OR = 16.24, 95% CI = 2.06–128.06) and two (OR = 1.98, 95% CI = 1.28–3.08) times higher admission rate, respectively. The admission rate in New Acuity Scale level 4 and 5 patients was significantly lower than that in level 3 patients (OR = 0.69 and 0.15, 95% CI = 0.55–0.85 and 0.06–0.41, respectively). All New Acuity Scale level 1 patients had high medical resource utilization (> 2 items), and the level 2 patients also had about twice the utilization of medical resources when compared to level 3 patients. In contrast, the level 4 and 5 patients were significantly less likely to utilize medical resources (OR = 0.66 and 0.26, 95% CI = 0.55–0.80 and 0.16–0.44; Table 4).

Discussion

Non-urgent visits have been known to cause ED overcrowding. This occurs 12–73% of the time according to a nationwide study in the United States.[17] This notion has contributed to efforts that have explored the reasons why patients with non-urgent medical problems use the ED rather than a primary care setting. Previous studies have supported the suggestion that inadequate primary care systems and poor insurance coverage might have led to inappropriate ED visits by patients with non-urgent problems. However, some authors have found that the lack of a regular source of care has no significant impact on ED utilization for problems that patients perceive as non-urgent.[13] A recent national, population-based study in the United States has found that 83.1% of ED visitors had a usual source of care other than the ED, and adults without a regular source of care are less likely to have an ED visit than those whose usual source of care is a private physician.[18] Furthermore, if insurance coverage and poor accessibility to primary care are the main reasons for non-urgent ED visits, we might therefore

Table 2. Bivariate analysis of urgent versus non-urgent patients in the ED*

	Urgent	Non-urgent	*p*
Marital status			0.001
Unmarried	88 (38.6)	140 (61.4)	
Married	252 (51.9)	234 (48.1)	
Occupation			0.005
Government employee	17 (34.7)	32 (65.3)	
Agricultural	25 (69.4)	11 (30.6)	
Industry/business/service	144 (43.4)	188 (56.6)	
Unemployed	82 (52.2)	75 (47.8)	
Others	69 (51.5)	65 (48.5)	
Health status			0.012
Chronic illness	108 (54.5)	90 (45.5)	
Reasons for visit			0.003
Trauma/injures	101 (40.1)	151 (59.9)	
Non-trauma	263 (51.9)	244 (48.1)	
Time of presentation			0.004
0 AM–8 AM	110 (57.0)	83 (43.0)	
8 AM–6 PM	147 (40.6)	215 (59.4)	
6 PM–0 AM	107 (52.5)	97 (47.5)	
Day of week			0.009
Saturday or Sunday	105 (41.2)	150 (58.8)	
Weekday	259 (51.4)	245 (48.6)	
Time needed coming to ED (min)			0.004
< 15	159 (41.8)	221 (58.2)	
15–30	147 (51.9)	136 (48.1)	
30–60	40 (62.5)	24 (37.5)	
> 60	11 (55.0)	9 (45.0)	
Choosing ED for its convenience			0.044
Agree	60 (40.3)	89 (59.7)	
Not agree	292 (49.7)	296 (50.3)	
ED is convenient to provide care			0.019
Agree	279 (50.6)	272 (49.4)	
Not agree	71 (40.3)	105 (59.7)	
Need ED to provide care			0.000
Exclusively need ED	219 (54.5)	183 (45.5)	
Could choose other facility	131 (39.9)	197 (60.1)	

**Data presented as n (%). ED = Emergency department.*

expect that, in a system of high insurance coverage and high accessibility to primary care, the occurrence of ED visits for non-urgent problems would be lower than that in other systems. However, we found that the number of non-urgent ED visits was still high in our study; therefore, there must be reasons other than insurance coverage and problems of accessibility. Afilalo et al found that perception of need (22%), familiarity with the ED (11%), and trust of the ED (7%) could contribute to non-urgent visits[19] Guttman et al found that 12 main themes emerge when people use EDs for non-urgent medical problems, which come under three categories: conceptions of need, appropriateness, and preference for the ED.[20] Our study also found that some people

Table 3. Multiple logistic regression model for non-urgent patients

Variable	OR (95% CI)	*p*
Marital status		0.037
Unmarried	1.55 (1.03–2.33)	
Married	(reference)	
Occupation		0.055
Government employee	(reference)	
Agricultural	0.25 (0.08–0.75)	0.014
Industry/business/service	0.72 (0.36–1.43)	0.351
Unemployed	0.51 (0.24–1.08)	0.079
Others	0.52 (0.25–1.09)	0.082
Health status		0.526
Chronic illness	0.88 (0.58–1.32)	
No chronic illness	(reference)	
Reasons for visit		0.454
Trauma/injures	1.16 (0.78–1.73)	
Non-trauma	(reference)	
Time of presentation		0.000
8 AM–6 PM	1.93 (1.34–2.77)	
Other time period	(reference)	
Day of week		0.063
Saturday or Sunday	1.41 (0.98–2.03)	
Weekday	(reference)	
Time needed coming to ED (min)		0.036
<15	1.46 (1.03–2.08)	
≥ 15	(reference)	
Choosing ED for its convenience		0.516
Agree	1.15 (0.75–1.77)	
Not agree	(reference)	
ED is convenient to provide care		0.113
Agree	0.72 (0.48–1.08)	
Not agree	(reference)	
Need ED to provide care		0.080
Exclusively need ED	0.73 (0.51–1.04)	
Could choose other facility	(reference)	

ED = Emergency department; OR = odds ratio; CI = confidence interval.

Table 4. A comparison of admission rate and medical resources

New Acuity Scale*	Admission rate		High medical resources (>2 items)†	
	OR (95% CI)	*p*	OR (95% CI)	*p*
Level 1	16.24 (2.06–128.06)	0.001	–†	–†
Level 2	1.98 (1.28–3.08)	0.002	1.90 (1.00–3.63)	0.029
Level 4	0.69 (0.55–0.85)	0.000	0.66 (0.55–0.80)	0.000
Level 5	0.15 (0.06–0.41)	0.000	0.26 (0.16–0.44)	0.000

**Compared to Level 3; †medical resources include pharmacy prescription, drug/fluid injections, laboratory examinations, image examinations, medical procedures, and consultations. Multiple items in each class were counted once only; all level 1 patients were regarded as "high medical resources". OR = odds ratio; CI = confidence interval.*

might prefer to use the ED for non-urgent medical problems, because 60% of these patients expressed that they might have chosen other facilities for their visit, despite the fact that they actually came to the ED. Preference for the ED was also supported by the finding that 54.4% of non-urgent patients presented during day time, when most primary care clinics were open. This is comparable to the finding by other researchers that 60% of patients who visited the ED for non-urgent care during regular business hours felt that the ED was the best place to receive care.[21]

The preference to use the ED for non-urgent problems might derive from certain personal traits of the decision makers, and these traits might lead to certain behavior patterns. We found in our study that unmarried people and government employees (*vs*. agricultural workers) were significantly more likely to have non-urgent ED visits. The non-urgent patients also presented to the ED in a diurnal pattern, which peaked between 8:00 and 18:00 hours, and tended to surge at the weekend. The health status of the patients and reasons for their visits might also affect the decision to use the ED for non-urgent problems; however, the association between health status and non-urgent ED visits, and the association between reasons for ED visits and non-urgent ED visits were not statistically significant by multivariate logistic regression analysis. A further study is warranted to establish the association between the demographic characteristics of decision-makers and their preference for the ED.

Besides preference for the ED, convenience factors seemed to play a role for non-urgent ED visits. The ED has several indigenous characteristics that make it convenient to those patients who prefer to use it. It is open 24 hours a day, it can carry out comprehensive evaluation in a single visit, and under current policies, patients will not be refused when they visit the ED. There are some other reasons that make EDs even more convenient in Taiwan. Patients in Taiwan usually wait less than 30 minutes to be seen by an emergency physician.[22] In addition, patients will not pay too much for ED services. Non-urgent patients in our study were more likely to take less than 15 minutes to get to the ED, and were more likely to choose the ED for its convenience. These discussions imply that the better the system, the more it will be utilized. We therefore infer that patients with certain personality traits prefer to choose the ED for their non-urgent problems, and the convenience of the ED increases this preference.

Therefore, do we still need to struggle with attempts to avoid inappropriate ED visits by patients with non-urgent medical problems? Gill has reviewed attempts to decrease non-urgent visits to the ED, but most of these have done little to reduce ED visits.[4] He has commented that it is more practical to change the way in which EDs provide care rather than attempting to change how patients seek care. After controlling the quality and cost of ED utilization by patients with non-urgent problems, he considered that using the ED for non-urgent care might not be detrimental to quality of care, and could even improve it by providing a portal of access into the primary care system. In contrast, diverting non-urgent patients away from the ED has been considered an unwise strategy and could even be unsafe, because 4–7% of non-urgent patients need hospitalization.[19,23] It might also be the case that diversion of these patients is unlikely to improve access for more urgent cases.[23] Schull suggested that it would be more fruitful to focus on improving the ED system to cope with increasing utilization, rather than blaming patients and trying to divert them to primary care settings.[24] We think that introduction of a high quality triage system is very important for coping with the problems caused by non-urgent ED patients.

We used a five-level triage system to determine the urgency of the ED patients. This new triage system was developed with reference to the CTAS, which assigns different maximum waiting times to see an emergency physician onto different levels of the triage scale. The maximum waiting time in the CTAS is 0 minutes for level 1, 15 minutes for level 2, and 30, 60 and 120 minutes for level 3, 4 and 5, respectively. Such a triage system with different levels of maximum expected waiting time

has been used for the study of non-urgent ED visits.[23] We chose this five-level triage system rather than the four-level one currently used in Taiwan because the latter has a lower rate of inter-observer agreement.[25] In addition, the four-level triage criteria in Taiwan have fewer indicators for urgency of the ED patients. In contrast, CTAS has been validated for its reliability,[26] and some authors have proved that the five-level CTAS is superior to the Taiwanese four-level triage system in terms of sensitivity and specificity.[27] The Taiwan Department of Health has funded a research program to develop a local five-level triage system (Taiwan Triage and Acuity Scale), which is also derived from CTAS, and has a minor revision of the maximum waiting time to physician interview of 10 minutes instead of 15 minutes for level 2.[28]

A reliable and effective triage system could help to improve the efficiency of ED operation, as well as the safety of medical care in the EDs. By assignment of corresponding colors to the five-level triage and acuity scale, plus changing the color labeling dynamically on the patient list in the computerized ED information system, Tsai et al improved the waiting times.[22] We also found that our five-level triage system reliably stratified patients with different acuity and severity, in terms of admission rate and utilization of medical resources. Therefore, introducing a sophisticated triage system to identity patients with non-urgent problems could safely reserve our limited medical resources for more urgent cases. The Taiwan Department of Health announced that the newly developed Taiwan Triage and Acuity Scale would be implemented in Taiwanese EDs by 2010. We recommend that some strategies should be introduced on the basis of this five-level triage system, such as differential reimbursement to control the cost of treating non-urgent patients, development of level specific case-mix classification to validate differential reimbursement, and development of level specific quality indicators (e.g. waiting time, time to completion of decisions, and length of stay) to improve the efficiency of ED operations.

The main limitation of our study was that we conducted our study during a 1-week period in a single institution, which might have biased the sampling of the population. The number of non-urgent ED visits in our study is higher than that in other unpublished local studies (52.5% *vs*. 39.1%), which could be attributed to sampling bias. In addition, the problems of overcrowding in medical centers might be different from that in community hospitals; therefore, any generalization of our results should be made with caution. With limited experience and time of training with the five-level triage system, the triage nurses might not have been familiar with the newly developed five-level triage system, and could have "over-triaged" or "under-triaged" the patients. However, our study validated the triage by stratifying patients with different severity, in terms of admission rate and utilization of medical resources.

We conclude that marital status, occupation (government employees *vs*. agricultural workers), time needed to get to the ED, and time of presentation were independent predictors of non-urgent visits to the ED. Preference to use the ED for medical care and convenience factors of the ED might contribute to non-urgent ED visits, and we infer that patients with certain personality traits prefer to choose the ED for their non-urgent problems, and that the convenience of the ED attracts them. A five-level triage system reliably stratified patients with different admission rates and utilization of medical resources, and could be helpful in reserving limited medical resources for more urgent patients.

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