Emergency department visits for non-urgent conditions in Iran: a cross-sectional study

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ABSTRACT

Objectives To determine the percentage of non-urgent (NU) visits in an Iranian emergency department (ED), to explore why patients with NU conditions refer to EDs and also to assess the association between patients’ characteristics and their visits.

Design A cross sectional study based on face to face survey.

Setting A territorial, teaching and military hospital in Tehran province, Iran.

Participants and data collection All patients who visited the ED during the 2-week period were recruited. Data were collected using a validated questionnaire.

Results Of 1884 patients who visited the ED, 1217 (64.6%) patients were triaged as NU while 667 (35.4%) were urgent and semiurgent visits cases. The most important reasons for NU visits were seeking prompt care (36.6%) and less costly care (35.9%). We found that NU visits have increased with younger patients, during weekends and night shifts, and with patients suffering from recurrent symptoms lasting in 1 week or less.

Conclusions EDs are a common source of care for NU problems in Iran. The most invaluable solution is building up special clinics for providing healthcare services to NU patients during the weekends and, in the busy and night shifts. Receiving higher fees from NU patients could also be adopted with caution. Promoting awareness and knowledge of both healthcare providers and patients about NU visits have increased with younger patients, during weekends and night shifts, and with patients suffering from recurrent symptoms lasting in 1 week or less.

BACKGROUND

Emergency departments (EDs) were first founded to provide prompt, high-quality, continuously accessible and unscheduled services for a wide range of urgent diseases and injuries. EDs became highly dependent and widely spread worldwide in the recent years. Globally, several reasons are accounted for the crowding in EDs as a notable problem. The increase in the number of non-urgent (NU) visits to the EDs contributes in aggravating this problem. NU cases are those patients who don’t experience life-threatening conditions nor require rapid care. In other words, they could receive the needed care in the primary healthcare or their medical investigation could be safely delayed without adverse consequences.

NU visits to EDs may yield in increased costs, lower continuity of care and timely care needed for urgent and semiurgent cases (USU). However, NU visits to EDs are still unresolved matter worldwide and greatly burden the quality of provided health services. This seems to be more serious in low and middle-income countries (LMICs) which suffer from resource constraints, meanwhile attempting to achieve the universal health coverage of their population. Thus, special attention should be paid to efficiency mechanisms and cost-containment strategies.

So far, several studies have been undertaken to identify the influential factors which result in the growing number of NU visits to EDs. To the best of our knowledge, this is the first study conducted in an ED at a military hospital in Iran aiming at measuring the percentage of NU visits and identify its associated factors as well.

Description of the healthcare system in Iran

In the recent three decades, the Iranian health system has undergone several reforms, faced...
many challenges and accomplished numerous successes. After the Islamic revolution in 1979, the country has experienced remarkable improvements in health outcomes such as life expectancy at birth which increased from 61.6 years in 1975 to 77.4 years in 2017.22 Similar to other countries, Iran is currently passes an epidemiological transition in which the burden has dramatically moved from the communicable diseases towards the non-communicable diseases which represent a substantial health problem.23

By establishing the Ministry of Health and Medical Education (MOHME) in 1985, provincial universities of medical sciences became responsible for managing the health centres and 70% of hospitals.19 Interestingly, the provincial universities of medical sciences supervises the health network in each province. Although the referral system in Iran is from the primary to the secondary and tertiary healthcare setting, patients tend to bypass this pathway and go directly to the secondary and tertiary setting, which in turn reflects a weak point within the Iranian referral system.24,25

METHODS

Design

A cross sectional, based on face-to-face survey was conducted. Our study aimed at measuring the percentage and identifying the leading causes of NU visits to the ED of a military teaching hospital over 2 weeks as a period for data collection.

Setting

The study was undertaken in a territorial, military, teaching hospital of 700 active bed and located in Tehran province. The hospital management board has signed a contract with the Armed Forces Medical Services Insurance Organization (AFMSIO) to co-work on rendering services to patients insured by this organisation.

Recently, the hospital was accredited by MOHME and excellently top-ranked the list of all other hospitals. Its ED provides 24/7 emergency care and successfully runs a residency programme in emergency medicine. The ED’s staff includes two emergency medicine specialists (EMSs), 10–15 nurses and 4–5 nurse’s aide in each shift.

Data collection and analysis

All the patients who visited the ED during our study period were recruited. Data were collected using a validated questionnaire,26 encompassing four sections: (1) information about the visits, for example, date, time and so on; (2) patients’ demographic characteristics including age, gender, marital status, health insurance coverage, educational level and the number of their visits to the ED; (3) main reasons behind seeking medical care; (4) the leading causes for referring to the ED (online supplementary appendix 1). The questionnaire was completed for each patient with the assistance of a triage nurse. The Canadian Triage and Acuity Scale was used in order to classify the visits. Consequently, the visit was considered NU when lies into levels 4 or 5.27,28 Data analysis was performed using SPSS V.18. Descriptive statistics (eg, mean and SD), χ² test and logistic regression were applied. P value ≤0.05 was the reference value for statistical significance.

Ethical considerations

The participation and withdrawal in/of the study was on voluntary basis.

Patients and public involvement

Patients were not involved in study designing, results’ interpretation nor drafting the manuscript. The patients and the general public will know about the study findings and its conclusions via the published material in peer-reviewed journals.

RESULTS

During the study period, 1884 visits to the ED were reported. The mean age of study participants was 44.1±20.87. Most of them were males with a mean age of 42.75±21.17 (n=1039, 55.1 %) while females were 845 (44.9 %) and the age mean was 45.76±20.39. Patients (less than 49 years old), unemployed, low-educated, insured, dependent and enrolees in AFMSIO programme were accounted for 57.1%, 47%, 55.4%, 97%, 60% and 90% of the total ED visits (1884), respectively. Meanwhile, patients visiting the ED for the first time, during the weekends, within the night shifts and experiencing symptoms for 1 day or less before seeking care represented 41.6%, 72%, 38.4% and 51% of the total visits to the ED, respectively (table 1).

Logistic regression analysis was found that the young age, weekends, night shifts and symptoms experiencing in 1 week or less were the main influencing factors (table 2).

The triage process, carried out by nurses, showed that just five patients (0.3%) lie into level 1, 43 patients (2.3%) into level 2, 619 patients (32.9%) into level 3 whereas 1188 patients (63.1%) had been categorised as level 4 and 29 patients (1.5%) as level 5. In general, 1217 patients (64.6%) had been classified as NU cases while 667 patients (35.4%) as USU cases. 44 patients (2.3%) had been referred directly to the acute care unit in the ED, 1775 patients (94.2%) to the EMS for screening, and 65 patients (3.5%) to the hospital outpatient clinics. Among the patients investigated by the EMS, 46.6% were admitted to the ED acute care unit.

1821 patients (96.7%) reported that the main reason for their visits to the ED was checking their complaints and symptoms. Seeing the physician and renewing the prescriptions, asking for sick leave and other reasons were the causes for 46, 6 and 11 visits, respectively.

As stated in table 3, two among these reasons were considered as substantial reasons. These were seeking prompt and cheaper care in the ED, (n=445, 36.6%) and (n=438, 35.9%), respectively. Only 61 patients (5%) stated that their urgent diseases and conditions were the reason behind visiting the ED.
Table 1  Sociodemographic characteristics of the patients referred to the ED

| Characteristic                                | Frequency n (%) | NU visits (n=1217) n (%) | USU visits (n=667) n (%) |
|----------------------------------------------|----------------|--------------------------|-------------------------|
| **Sex**                                      |                |                          |                         |
| Male                                         | 1039 (55.1)    | 675 (55.5)               | 364 (54.6)              |
| Female                                       | 845 (44.9)     | 542 (44.5)               | 303 (45.4)              |
| **Age group (y)**                            |                |                          |                         |
| Younger age group (<49)                      | 1075 (57.1)    | 777 (63.8)               | 298 (44.7)              |
| Older age group (>49)                        | 809 (42.9)     | 440 (36.2)               | 369 (55.3)              |
| **Education Level**                          |                |                          |                         |
| Non-academic education and degrees           | 1043 (55.4)    | 658 (54.1)               | 385 (57.7)              |
| Academic education and degrees               | 841 (44.6)     | 559 (45.9)               | 282 (42.3)              |
| **Employment status**                        |                |                          |                         |
| Unemployed                                   | 886 (47)       | 572 (47)                 | 314 (47.1)              |
| Employed                                     | 484 (25.7)     | 342 (28.1)               | 142 (21.3)              |
| Retired                                      | 336 (17.8)     | 180 (14.8)               | 156 (23.4)              |
| Self-employed                                | 68 (3.6)       | 41 (3.4)                 | 27 (4)                  |
| Student                                      | 110 (5.8)      | 82 (6.7)                 | 28 (4.2)                |
| **Being pregnant**                           |                |                          |                         |
| Yes                                          | 16 (1.9)       | 10 (1.8)                 | 6 (2)                   |
| No                                           | 829 (98.1)     | 532 (98.2)               | 297 (98)                |
| **Health insurance coverage**                |                |                          |                         |
| Insured                                      | 1829 (97.1)    | 1177 (96.7)              | 652 (97.8)              |
| Uninsured                                    | 55 (2.9)       | 40 (3.3)                 | 15 (2.2)                |
| **Visit shift**                              |                |                          |                         |
| Morning                                      | 527 (28)       | 303 (24.9)               | 224 (33.6)              |
| Afternoon                                    | 634 (33.7)     | 428 (35.2)               | 206 (30.9)              |
| Night                                        | 723 (38.4)     | 486 (39.9)               | 237 (35.5)              |
| **Visit day**                                |                |                          |                         |
| Weekends                                     | 1356 (72)      | 846 (69.5)               | 510 (76.5)              |
| Other weekdays                               | 528 (28)       | 371 (30.5)               | 157 (23.5)              |
| **Head of families/ dependents**             |                |                          |                         |
| Head of families                             | 756 (40.1)     | 466 (38.3)               | 290 (43.5)              |
| Dependents                                   | 1128 (59.9)    | 751 (61.7)               | 377 (56.5)              |
| **Type of health insurance organisations**   |                |                          |                         |
| Uninsured                                    | 55 (2.9)       | 40 (3.3)                 | 15 (2.2)                |
| Iran Health Insurance Organization           | 19 (1)         | 7 (0.6)                  | 12 (1.8)                |
| Armed Forces Medical Services Insurance      | 1699 (90.2)    | 1105 (90.8)              | 594 (89.1)              |
| Organization                                 | Social Security Organization | 60 (3.2) | 38 (3.1) | 22 (3.3) |
| Other                                        | 51 (2.7)       | 27 (2.2)                 | 24 (3.6)                |
| **Duration of symptoms before seeking care** |                |                          |                         |
| One day or less                              | 961 (51)       | 659 (54.1)               | 302 (45.3)              |
| One week or less                             | 747 (39.6)     | 459 (37.7)               | 288 (43.2)              |
| >One week                                    | 176 (9.3)      | 99 (8.1)                 | 77 (11.5)               |

ED, emergency department; NU, non-urgent; USU, urgent and semi-urgent.

Interestingly, 1338 patients pointed out that they visited the ED as a result of lacking healthcare centres in their surrounding area. Our findings revealed that 34.7% of the total study participants and 36.4% of NU patients preferred the hospital as a site for receiving treatment whereas 32.6% showed no preferences towards the place.

Most patients (n=1404, 74.5%) declared that they themselves had decided to visit the ED for receiving care while other patients were urged to do so by their family members (n=301, 16%), general practitioners (n=165, 8.8%) or others (n=14, 0.7%). Compared with the aforementioned results, 77.3% among the NU patients decided by themselves to seek care in the ED meanwhile the family members, general practitioners and other people had guided 14.5%, 7.8% and 0.4% of NU patients to visit the ED, respectively.

**DISCUSSION**

In our study, 64.6% and 35.4% of the total 1884 visits had been classified as NU and USU visits, respectively. NU and USU visits were significantly associated with the patients’ age, night shift, day of the visit (weekends), and duration of symptoms experiencing before demanding care. Seeking prompt and cheaper care were the main reasons that led most of NU patients to receive care in the ED. 5% of the patients stated that the urgency of their health

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These results. To the best of our knowledge, this was the first study conducted in a military hospital in LMICs. Regarding some crucial issues. For example, ED services in USA are typically viewed as expensive care for all insured and uninsured patients. Therefore, raising the fees for USU visits, and this was consistent with the results of previous studies.26 41 42

We found out that NU visits to the ED were increasing during the night shifts and this could be linked to the limited access to healthcare services at night.43 This result was in line with Jalili et al study.26 but contradictory to another study conducted in Brazil and revealed that the NU visits increase during day shifts.44

Additionally, closure of healthcare centres and physicians’ clinics during holidays (ie, formal anniversaries) as well as weekends (ie, Thursdays and Fridays in Iran) may explain the increase in both USU and NU visits to the ED.45 The above result was compatible with other studies.26 32 46 47

Furthermore, the present study discovered that the duration of symptoms preceding seeking care was also notably associated with NU visits. Backman et al found that about 43% of NU visits had been reported within 1 day or less of appearing symptoms.48 Barbadoro et al found that the emerging symptoms within a week or less were the most likely cause of NU visits.49 In another study, it was found that the patients were interested in visiting the ED as soon as their symptoms appear in order to convince the health professionals about their serious conditions.50

Receiving quick (36.6%) and inexpensive (35.9%) care in the ED the substantial reasons for NU visits in this study. Similarly, in the literature, receiving faster care has also been determined as a main reason for the NU visits.51

In our study, to be enrolled in AFMSIO insurance programme and consequently receiving care free-of-charge also contributed in the growing number of ED visits, and this was consistent with the results of previous studies.26 51

This study confirmed that Iran, as a middle-income country, contrast some other high-income countries regarding some crucial issues. For example, ED services in USA are typically viewed as expensive care for all insured and uninsured patients. Therefore, raising the fees for NU cases could be one of the suggested solutions to keep up providing usual, rationale, cost-effective, quality care for USU patients. However, 97.1% of all patients and 96.7% of NU patients who visited the ED were insured, but we have to be cautious about imposing more fees for ED services as 47% of NU patients were unemployed thus it might affect them as a vulnerable group within the community via causing more financial hardship by extra out-of-pocket payment. Rather, further research is recommended to assess the impact of increasing the fees on population with different health insurance coverage.

Our results also showed that some NU patients needed specialist care but this should not necessarily happen in the ED. In other words, para-clinical departments, mobile centres and physician offices can properly play a role in addressing and providing these specialised care services. To the best of our knowledge, this was the first study conducted in a military hospital in LMICs. Regarding

**Table 2** The results of logistic regression analysis

| Variables                              | Total                  |
|----------------------------------------|------------------------|
| Age group (y)                          | 0.468 (0.378–0.579)*   |
| Educational level                      | 0.856 (0.688–1.066)    |
| Employment status                      | 0.973 (0.885–1.071)    |
| Health insurance coverage              | 1.113 (0.496–2.496)    |
| Visit shift                            | 1.161 (1.027–1.313)*   |
| Visit day                              | 1.374 (1.100–1.716)*   |
| Head of families/dependents            | 1.157 (0.889–1.505)    |
| Type of health insurance organisations | 0.876 (0.683–1.124)    |
| Duration of symptoms before seeking care | 0.816 (0.703–0.948)*  |
| Gender                                 | 0.870 (0.668–1.132)    |
| Being pregnant†                        | 1.209 (0.423–3.454)    |

*p<0.05.
†In females.

**Table 3** Reasons for NU visits to the ED

| Reasons                              | No. (%) |
|--------------------------------------|---------|
| Proximity                            | 103 (8.5) |
| Closure of other centres or office   | 39 (3.2) |
| Being referred by a clinic or a physician’s office | 102 (8.4) |
| Having medical records in this hospital | 359 (29.5) |
| Perceived urgent problems/urgency of the problem | 61 (5) |
| Receiving better-off quality care    | 41 (3.4) |
| Dissatisfaction with the clinic or physicians’ offices | 24 (2) |
| Receiving prompt care               | 445 (36.6) |
| Seeking lower costs and cheaper care | 438 (36) |
| Transported by EMS ambulances        | 4 (0.3) |
| Being an employee at this hospital (the patients themselves or their families) | 22 (1.8) |
| No reasons mentioned                | 17 (1.4) |
| Others                               | 58 (4.8) |

ED, emergency department; EMS, emergency medicine specialist.
CONCLUSION
This study showed that the ED is a common destination for patients of NU conditions in Iran. Due to the lower costs and insurance coverage, patients prefer to seek care in ED rather than physicians’ offices or other private centres. One of the suggested solutions is to establish special clinics for rendering healthcare services to the NU patients in case of busy-working shifts, during weekends as well as the night shifts. Increasing the fees for ED services can be another suggestion but meanwhile should also be covered by the insurance in case of urgent conditions and this in turn will prevent any financial hardship.

Promoting awareness of both healthcare providers and patients about the role of ED will yield in improving the services provided to USU patients. As a long-term solution, the execution of effective family physician programme and referral system, across the country, may help in better-off situation for all families as well as patients of various conditions. More studies have to be undertaken in order to determine the root causes behind the NU visits to ED. A factual appraisal of the proposed solutions is essential to decide about the required resources and how to allocate them efficiently to avoid the financial burden resulting from the NU visits to the ED in Iranian hospitals.

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REFERENCES
1. Gonçalves-Bradley D, Khangura JK, Flodgren G, et al. Primary care professionals providing non-urgent care in hospital emergency departments. Cochrane Database Syst Rev 2018;311.
2. Ieraci S, Cunningham P, Talbot-Stern J. Emergency medicine and “acute” general practice: comparing apples with oranges. Australian Health Review 2000;23:152–61.
3. Ohns MJ, Oliver-McNeil S, Nantas-Smith LM, et al. Nonurgent Use of the Emergency Department by Pediatric Patients: A Theory-Guided Approach for Primary and Acute Care Pediatric Nurse Practitioners. J Pediatr Health Care 2016;30:339–46.
4. Stagg BC, Shah MM, Talwar N, et al. Factors affecting visits to the emergency department for urgent and Nonurgent ocular conditions. Ophthalmology 2017;124:720–8.
5. Unwin M, Kinsman L, Rigby S. Why are we waiting? Patients’ perspectives for accessing emergency department services with non-urgent complaints. Int Emerg Nurs 2016;29:3–8.
6. Bardelli F, Kaplan L. Urgent encounters in a Swiss medical emergency unit. Swiss Med Wkly 2013:143.
7. CJ N, Liao PJ, Chang YC, et al. Predictive factors for hospitalization of nonurgent patients in the emergency department. Medicine 2016;95.
8. McCormack LA, Jones SG, Coulter SL. Demographic factors influencing nonurgent emergency department utilization among a Medicaid population. Health Care Manag Sci 2017;20:395–402.
9. Weinick RM, Burns RM, Mehrotra A. Many emergency department visits could be managed at urgent care centers and retail clinics. Health Aff 2010;29:1600–10.
10. Baker LG, Baker LS. Excess cost of emergency department visits for nonurgent care. Health Aff 1994;13:162–71.
11. Afifalo J, Marinovich A, Afifalo M, et al. Nonurgent emergency department patient characteristics and barriers to primary care. Acad Emerg Med 2004;11:1002–10.
12. Liang Y-W, Chen W-Y, Chang H-F. Effects of continuity of care on emergency department visits among the elderly. Taiwan Gong Gong Wei Sheng Za Zhi 2016;35.
13. Elkurn N, Fahim M, Shoukri M, et al. Which patients wait longer to be seen and when? A waiting time study in the emergency department. East Mediterr Health J 2009;15:416–24.
14. Lega F, Mengoni A. Why non-urgent patients choose emergency over primary care services? empirical evidence and managerial implications. Health Policy 2008;88:326–38.
15. Mousavi SM, SadeghiFar J. Universal health coverage in Iran. Lancet Glob Health 2016;4:e305–6.
16. Attenstaedt R, Gregory J, Price-Jones C, et al. Why do patients with nonurgent conditions present to the emergency department despite the availability of alternative services? European Journal of Emergency Medicine 2015;22:370–3.
17. Burnett MG, Grover SA. Use of the emergency department for nonurgent care during regular business hours. CMAJ 1996;154:1345–51.
18. Guttmann N, Zimmerman DR, Nelson MS. The many faces of access: reasons for medically Nonurgent emergency department visits. J Health Polit Policy Law 2003;28:1089–120.
19. Idil H, Kilic TY, I, et al. Non-Urgent adult patients in the emergency department: causes and patient characteristics. Turkish Journal of Emergency Medicine, 2018.
20. Koziol- McLain J, Price DW, Weiss B, et al. Seeking care for nonurgent medical conditions in the emergency department: through the eyes of the patient. *Journal of Emergency Nursing* 2000;26:554–63.

21. Kua PHJ, Wu TL, Ong E-LT, et al. Understanding decisions leading to nonurgent visits to the paediatric emergency department: caregivers’ perspectives. *Singapore Med J* 2016;57:314–9.

22. Dicker D, Nguyen G, Abate D, et al. Global, regional, and national age-sex-specific mortality and life expectancy, 1950–2017: a systematic analysis for the global burden of disease study 2017. *The Lancet* 2018;392:1684–735.

23. Peykari N, Hashemi H, Dinarvand R, et al. Evaluation of non-urgent visits to the paediatric emergency service in Nigeria: pattern and correlates. *Emerg Med Int* 2014;2014:1–7.

24. Shahabi S, Fazlalizadeh H, Stedman J, et al. The impact of international economic sanctions on Iranian cancer healthcare. *Health Policy* 2015;119:1309–18.

25. Jalili M, Shirani F, Hosseininejad M, et al. Emergency department nonurgent visits in Iran: prevalence and associated factors. *Am J Manag Care* 2013;19:e1–8.

26. Safavi M, Kheybari F, Aghazadeh A, et al. A comparative study of triage system with international standards in emergency department affiliated TUMS, *Journal of Army Nursing Faculty* 2009;9:9–15.

27. Tsai JC-H, Liang Y-W, Pearson WS. Utilization of emergency department in patients with non-urgent medical problems: patient preference and emergency department convenience. *J Formos Med Assoc* 2010;109:533–42.

28. Selasawati HG, Naing L, Wan Aasim WA, et al. Inappropriate utilization of emergency department services in Universiti Sains Malaysia Hospital. *The Medical journal of Malaysia* 2004;59:26–33.

29. Bianco A, Pileggi C, Angellillo IF. Non-Urgent visits to a hospital emergency department in Italy. *Public Health* 2003;117:250–5.

30. Asdeoun II, Odgbubon AA, Jeje OO, et al. Urgent and nonurgent presentations to a psychiatric emergency service in Nigeria: pattern and correlates. *Emerg Med Int* 2014;2014:1–7.

31. Eroglu SE, Toprak SN, Urgan O, et al. Evaluation of non-urgent visits to a busy urban emergency department. *Saudia Medical Journal* 2012;33:967–72.

32. Selasawati HG, Naing L, Wan Aasim WA, et al. Factors associated with inappropriate utilisation of emergency department services. *Asia Pac J Public Health* 2007;19:29–36.

33. Lang T, Davido A, Diakité B, et al. Non-Urgent care in the hospital medical emergency department in France: how much and which health needs does it reflect? *J Epidemiol Community Health* 1996;50:456–62.

34. Sarver JH, Cydulka RK, Baker DW. Usual source of care and nonurgent emergency department use. *Academic Emergency Medicine* 2002;9:916–23.

35. Killfoyle KA, Vrees RA, Matteson KA, et al. Nonurgent emergency department use during pregnancy: associated factors and implications. *Obstetrics & Gynecology* 2014;123.

36. Campbell PA, Pai RK, Derksen DJ, et al. Emergency department use by family practice patients in an academic health center. *Family medicine* 1998;30:272–5.

37. Liu T, Sayre MR, Carleton SC. Emergency medical care: types, trends, and factors related to Nonurgent visits. *Academic Emergency Medicine* 1999;6:1147–52.

38. Petersen LA, Burstein HR, O’Neil AC, et al. Nonurgent emergency department visits: the effect of having a regular doctor. *Medical care* 1998;36:1249–55.

39. Schappert SM. The urgency of visits to hospital emergency departments: data from the National Hospital ambulatory medical care survey (NHAMCS), 1992. *Statistical bulletin* 1995;76:10–19.

40. Vedovetto A, Soriani N, Merlo E, et al. The burden of inappropriate emergency department pediatric visits: why Italy needs an urgent reform. *Health Serv Res* 2014;49:1290–305.

41. Davis JW, Fujimoto RY, Chan H, et al. Identifying characteristics of patients with low urgency emergency department visits in a managed care setting. *Manag Care* 2010;19:38–44.

42. Malott T. Exploring factors associated with non-urgent emergency department visits and hospital admissions for diabetes related problems in three community based hospitals in southwestern Ontario, 2015.

43. Carret MLV, Fassa AG, Kawachi I. Demand for emergency health service: factors associated with inappropriate use. *BMC Health Serv Res* 2007;7:131.

44. Uscher-Pines L, Pines J, Kellermann A, et al. Deciding to visit the emergency department for non-urgent conditions: a systematic review of the literature. *The American journal of managed care* 2013;19:47–59.

45. Hauser C. Predictors of emergency department utilization by homeless persons: a national study. *ProQuest*, 2007.

46. DeWood CA. The influence of patient-reported provider availability factors on nonurgent emergency department use. *Citeseer*, 2011.

47. Backman A-S, Blomqvist P, Lagerlund M, et al. Characteristics of non-urgent patients: cross-sectional study of emergency department and primary care patients. *Scandinavian Journal of Primary Health Care* 2008;26:181–7.

48. Barbadoro P, Di Tondo E, Menditto VG, et al. Emergency department non-urgent visits and hospital readmissions are associated with different socio-economic variables in Italy. *PLoS One* 2015;10:e0127823.

49. Durand A-C, Palazzolo S, Tanti-Hardouin N, et al. Nonurgent patients in emergency departments: rational or irresponsible consumers? perceptions of professionals and patients. *BMC Res Notes* 2012;5:525.

50. Rubin MA, Bonnin MJ. Utilization of the emergency department by patients with minor complaints. *J Emerg Med* 1995;13:839–42.

51. Bahadori M, Teymourzadeh E, Moussavi SM. Nonurgent visits to emergency departments in Iran and the health system research agenda: a call for action. *J Emerg Nurs* 2018;44:323–4.