Inappropriate use of emergency services: a systematic review of prevalence and associated factors

Prevalência e fatores associados ao uso inadequado do serviço de emergência: uma revisão sistemática da literatura

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Abstract

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This systematic review aimed to measure the prevalence of inappropriate emergency department (ED) use by adults and associated factors. The review included 31 articles published in the last 12 years. Prevalence of inappropriate ED use varied from 20 to 40% and was associated with age and income. Female patients, those without co-morbidities, without a regular physician, without a regular source of care, and those not referred to the ED by a physician also showed more inappropriate ED use, with the relative risk varying from 1.12 to 2.42. Difficulties in accessing primary health care (difficulties in setting appointments, longer waiting periods, and short business hours at the primary health care service) were also associated with inappropriate ED use. Thus, primary care requires fully qualified patient reception and efficient triage to promptly attend cases that cannot wait. It is also necessary to orient the population on situations in which they should go to the ED and on the disadvantages of consulting the ED when the case is not really urgent.

Emergency Medical Services; Health Services Misuse; Adult; Evaluation Studies

Introduction

Emergency treatment aims to perform procedures to immediately relieve well-circumscribed situations, and is not intended to include on-going care [1]. However, patients frequently seek the emergency department (ED) to obtain immediate attention in order to perform tests and administer medication to relieve symptoms. Although this may appear appropriate from the patient's perspective (given existing limitations in other levels of health care), this type of use places a burden on the health system and increases the demand on the ED for care that could be managed better at other levels and that in a sense competes with true emergency cases. Meanwhile, such demand generates a kind of care that fails to create a bond with the health service (in which patients would receive not only treatment to relieve their immediate symptoms, but also health education) or to link with on-going care in order to prevent complications and new illnesses [2,3,4]. Such use of ED services is thus considered inappropriate.

The inappropriate use of ED services is a common problem in various countries, and the issue has thus been studied for more than two decades [5]. However, the wide range of criteria used to define inappropriate use of ED services has been an obstacle to systematic reviews on the topic [6]. Numerous studies have evaluated its prevalence and many have also examined factors associated with such inappropriate use, but most

studies have been limited to evaluating socio-demographic factors, without examining other aspects in depth, such as those related to other levels of care.

The existing systematic reviews approach the historical profile of inappropriate ED use in the United States [7], criteria to define inadequacy of ED services [8], patterns in ED use by the elderly [9], and the role of expanding primary health care and bad experiences in primary health care in determining inappropriate ED use, in publications from 1971 to 1997 [10]. However, despite the existing reviews, there are no recent articles summarizing the findings on prevalence of inappropriate ED use or its determinants, particularly those related to health needs and access to health services. Thus, the current article presents a systematic literature review, exploring the principal criteria used to define inappropriate ED use, identifying the problem's prevalence and examining the state-of-the-art on factors associated with inappropriate ED use. Knowledge of the prevalence and factors associated with inappropriate ED use can help orient public policies to reduce the problem.

Methods

A literature review was performed in the following databases: MEDLINE (International Health Sciences Literature), LILACS (Latin American and Caribbean Health Sciences Literature), SciELO (Scientific Electronic Library Online), Harvard Electronic Library, website of the World Health Organization (http://www.who.int), website of Free Medical Journals (http://www.freemedical journals.com), and the Library of the Graduate Course in Epidemiology at the Federal University in Pelotas, Brazil. In addition, all the references from the initially selected articles were reviewed. Inclusion criteria for the articles were: indexed articles, published since 1995, with samples of adults, measuring prevalence and/or factors associated with inappropriate use of emergency services. Articles were excluded that did not clearly present the criteria used to define the outcome.

The following words were searched in "all fields": inappropriate, inadequate, nonurgent, non-urgent, misuse, appropriateness, unnecessary, nonemergency, demand, visits, consultation AND emergency department, emergency service, emergency services, emergency room, urgency department, urgency service, urgency services, urgency room, and their equivalents in Spanish and Portuguese.

Qualitative evaluation

The selected articles that evaluated factors associated with inappropriate ED use were classified according to the criteria proposed by Downs & Black [11]. Since no experimental study was selected, the items that only applied to this type of study were excluded. Using this criterion, we evaluated whether:
• the study's hypotheses and objectives were described;
• the principal outcomes to be measured were described;
• the characteristics of the subjects included in the study were described (cohort or case-control);
• the distribution of the principal confounding factors in each comparison group was described;
• the study's principal findings were described;
• in cohort studies, the characteristics of the subjects lost to follow-up were described;
• the probability of association (p-value) with the principal outcomes was reported precisely;
• the sample selected for the study was representative;
• the sample included in the study was representative;
• analyses not originally planned in the project were clearly indicated;
• in cohort studies, the different follow-up times were adjusted in the analysis; or, in case-control studies, the time transpired between determinants and outcome was the same for cases and controls;
• the statistical tests used to measure the principal outcomes were appropriate;
• the measurements to evaluate the principal outcomes were accurate;
• the individuals in the different groups were recruited from the same population;
• the individuals in the different groups were recruited during the same time period;
• the principal confounding factors were adequately adjusted in the analysis;
• losses of individuals during follow-up were considered; and
• the study's power to detect important effects was sufficient, with a significance level of 5%.

Two epidemiologists performed the scores, with a total of 18 items assessed according to the Downs & Black criteria, with a maximum score of 19 points. Whenever there was disagreement, the two epidemiologists conferred until reaching a consensus.

Data extraction and synthesis

Data were extracted from the studies with the respective year of publication, country where the study was performed, and design. Evaluation of factors associated with inappropriate ED use was based on the Downs & Black score, study characteristics, and effect measurements, analyzing the consistency of the results.

Results

A total of 5,124 articles were identified in the online databases, of which 4,938 were ruled out by reading the title and abstract, since, since they did not specify the study outcome. Of the 186 remaining studies, 31 were selected that evaluated prevalence rates and 22 that measured factors associated with inappropriate ED use.

Criteria for defining inappropriate ED use

The criteria for defining an inappropriate ED visit varied considerably between the studies, and the following were the most frequent: waiting time until receiving care, medical assessment of risk of death or target organ injury, and resources needed for care (whether only available in the ED or not). Other aspects included: self-perceived urgency, need for diagnostic tests, immediate treatment, and/or observation, and others (Table 1). Each of these items also varied greatly. For example, the list of tests considered in the definition of urgencies varied for each criterion.

We identified two standardized criteria for defining inappropriate use: (i) the Canadian Triage and Acuity Scale (CTAS) [12], which classifies ED care in five levels, based on the waiting time allowed for the patient to be examined by the physician, risk of death, vital signs, pain level, possibility of complications, and origin of the injury and (ii) the Hospital Urgencies Appropriateness Protocol (PAUH) [13,14,15,16], defining the case as urgent whenever one of the items evaluated was met. This protocol considers criteria of severity (for example, altered vital signs and active hemorrhages), diagnosis (like orders for laboratory or imaging tests), treatment (like need for IV medication), and origin of the need for seeking the ED (for example: coming directly from a traffic accident or symptoms suggesting vital urgency) (Table 1).

Prevalence

Prevalence of inappropriate ED use varied from 10 to 90%, based on the criterion used, and in nearly half of the studies it varied from 24 to 40% [6,12,13,14,16,17,18,19,20,21,22,23,24,25,26]. All these articles presented similar criteria, evaluating the number of hours the patient could wait without risk of death, need for tests or treatments, need for hospitalization, possibility of treatment at another level of care, and observation time (Table 1).

Of the 11 articles that reported prevalence rates for inappropriate ED use greater than or equal to 45%, seven [6,15,27,28,29,30,31,32] used more rigorous criteria to define appropriate ED use, such as requiring observation for more than 12 hours or hospitalization; three other [33,34,35] used samples that excluded populations presenting greater severity. Meanwhile, among seven studies [6,36,37,38,39,40,41] that found prevalence rates lower than 20%, three used self-perceived urgency as the definition of appropriate ED use [6,37,38]; two others used more rigorous criteria to define inappropriate use [36,41]; and the study by Finn et al. [40] evaluated a lower-risk population for inappropriate use (65 years or older) (Table 1).

Characterization of studies on association

The review included 19 cross-sectional studies, two case-controls, and one cohort. Eight studies conducted were in European countries, seven in North America, one in Central America, one in Oceania, three in China, and two in South America.

The methodological score varied from 5 to 13 points, with a mean of 9 (median = 8). Of the studies evaluated, five had a score or 7 or less and eight had scores of 10 or more. In addition to the limitations related to study design (six items could not be scored in 19 studies, since they were cross-sectional), the principal limitations in the Downs & Black classification were those related to data analysis, such as performing only univariate analysis, and the failure to describe the strategy used in the multivariate analysis, or to the sample's representativeness. Table 2 shows the scores for each study.

Characteristics of inappropriate ED use

As for time of arrival at the ED, the early morning hours (midnight to 08:00 AM) was the period with the most appropriate ED use [13,14,21,22,23,28], while the morning and afternoon shifts showed the heaviest ED use by patients with inappropriate complaints [13,21]. Day of the week was not associated with inappropriate use [12,14,22,37]. After controlling for confounding factors, duration of symptoms was directly associated with inappropriate ED use [12,13,22,37].

Table 1

Criteria for definition of inappropriate emergency department use, 2007.

Article	Protocol	Country	Year of publication	Criterion	Prevalence of inappropriate use
North America					
Lowe & Bindman [6]	Criterion of the San Francisco General Hospital	USA	1997	Classification of appropriate ED use based on a total of 7 criteria: • According to patient (two criteria): Non-urgent: lower self-perception of urgency (in 5 levels) or patient agreed to schedule MD appointment within 1-3 days • According to nurse triage (2 criteria): 4-point scale: category 4 was avoidable consultations • According to medical record (three criteria): when not necessary to hospitalize, perform diagnostic tests, or special treatment (e.g.: IV medication, O2), and could wait > 24 hours to be evaluated and treated	20 to 37% in 5 criteria; 90% hospitalization criterion; 10% self-perceived urgency criterion
Derlet et al. [41]		USA	1995	Classified as urgent or non-urgent: • Non-urgent: presence of vital signs within normal limits, presence of non-urgent complaints, complementary tests without important alterations, and no indication of high risk. After triage, these patients were referred for outpatient care without ED consultation	18%
Gill & Riley [38]		USA	1996	Classified as urgent and non-urgent: • Urgent: patient's self-perceived urgency	18%
Gill et al. [29]		USA	1996	Classification as urgent and non-urgent: • Urgent: when the professional felt there was risk of death, need for treatment within few hours to prevent severe complications • Non-urgent: all other situations	37 to 91%
Rubin & Bonnin [24]		USA	1995	Classified as urgent and non-urgent: • Urgent: resulted in hospitalization, referred by another health service, or came from accidents, signs and symptoms suggesting severity, < 16 years (with no accompanying person), and suspicion of sexual abuse • Non-urgent: other cases	37.1%
Petersen et al. [34]	Based on study by Baker et al.	USA	1998	Classified as urgent or non-urgent: • Urgent: altered vital signs, acute chest pain (with cardiac risk factor), acute asthma (< 1 week), acute abdominal pain (with associated risk factors). • Non-urgent: all other situations	50%
Young et al. [35]		USA	1996	Classified in 3 levels: Emergency, urgency, and non-urgency. • Non-urgent: patient could wait until next day (> 12 hours) to receive treatment, according to nurses, depending on vital signs and brief evaluation to discard urgent conditions.	79%

(continues)

Table 1 (continued)

Article	Protocol	Country	Year of publication	Criterion	Prevalence of inappropriate use
North America					
Liu et al. [30]		USA	1999	Classified as urgent and non-urgent: • Urgent: when patient required immediate attention, with risk of death or functional injuries. • Non-urgent: other situations	54.1%
Sarver et al. [25]		USA	2002	Classified as urgent or non-urgent: • Urgent: when resulted in hospitalization; when required tests or surgical procedure in patients reporting accident, injury, diagnosis, or treatment, without having been referred; or, in patients reporting accident or injury in the last 3 days or symptoms requiring diagnosis and treatment • Non-urgent: All other situations	40%
Billings et al. [18]		USA	2000	Classified in 4 levels: non-urgent; emergency treatable in primary care; emergency requiring ED, although prevented or avoided; and emergency requiring ED and could not be prevented or avoided. • Non-urgent: complaint not requiring immediate medical care (< 12 hours)	41.3%
Michelen et al. [20]		USA	2006	Classified in 4 levels: non-urgent; urgent for primary care; urgent that required ED, but could be prevented and treated; and emergency. • Non-urgent: situations in which evaluation and treatment could take more than 12 hours	31%
McCaig & Nawar [39]		USA	2006	Classified in 5 levels: emergency, urgent, semi-urgent, non-urgent, and unknown or not triaged: • Non-urgent: situation not requiring immediate attention, could be evaluated in 2-24 hours	12.5%
Afilalo et al. [36]		Canada	1995	Classified in 3 categories: • Category 3 (non-urgent): when no need to receive immediate care, within 20 minutes, not referred by a health professional, did not require urgent investigation or treatment, did not require remaining in observation, absence of acute and severe situation or without need to perform differential diagnosis, could wait for > 6 hours to be evaluated in the ED or other health service.	15.2%
Béland et al. [17]		Canada	1998	Classified in 3 levels: emergency, urgent, and non-urgent: • Non-urgent: did not require medical intervention within 24 hours to prevent serious sequelae or death, and did not require resources only available in the ED.	27.8%

(continues)

Table 1 (continued)

Article	Protocol	Country	Year of publication	Criterion	Prevalence of inappropriate use
North America					
Afilalo et al. [12]	CTAS Criterion	Canada	2004	Classified in 5 levels of severity, based on waiting time to be evaluated, frequency with which patient could be evaluated while waiting to be seen, and presence of complication (altered vital signs, level of pain, and mechanism of injury, e.g., car accident). • Level 5 (Non-urgent): patient could wait 2 hours to be seen by MD without risk of death and could be investigated or receive intervention elsewhere in the health system	25%
Fajardo-Ortiz & Ramirez-Fernandez [28]		Mexico	2000	Classified as true urgency or not: • True urgency: after medical evaluation, the patient presented indication of remaining in hospital for 24 hours, need for surgery, ICU or death. • Non-urgent: other situations	64.1%
Europe					
Dale et al. [19]		UK	1995	Classified as urgent or non-urgent: • Non-urgent: came by themselves, could be resolved by primary care, no need for immediate intervention.	40.2%
Coleman et al. [33]		UK	2001	Classified as urgent or non-urgent: • Non-urgent: patients with non-urgent injuries or diseases that could be treated elsewhere.	55%
Oterino et al. [14]	PAUH	Spain	1999	Classified as true urgency or not: • Urgent: criteria for severity of signs and symptoms, treatment, diagnoses, related to follow-up on consultation and extra criteria for patient not referred by MD. • Non-urgent: did not meet any of the above criteria.	26,8%
Sempere-Selva et al. [16]		Spain	2001	Classified as urgent or not: • Urgent: criteria for severity of signs and symptoms, treatment, diagnoses, related to follow-up on consultation and extra criteria for patient not referred by MD. • Non-urgent: when did not meet any of the above criteria.	29.6%
Sánchez-López et al. [15]	PAUH Modified PAUH	Spain	2004	Classified as urgent or not: • Urgent: criteria for severity of signs and symptoms, treatment, diagnoses (excluded X-ray), related to follow-up on consultation and extra criteria for patient not referred by MD. • Non-urgent: did not meet any of the above criteria.	46%
Pereira et al. [22]		Portugal	2001	Classified as appropriate or not: • Appropriate: resulted in hospitalization, death, was transferred to another hospital, or explicit criteria based on diagnostic tests or specific treatments (modified, excluding chest X-ray) • Inappropriate: other situations.	31.3%

(continues)

Table 1 (continued)

Article	Protocol	Country	Year of publication	Criterion	Prevalence of inappropriate use
Europe					
Oktay et al. [21]	Based on CTAS	Turkey	2003	Classified in 3 levels: emergency, urgent, and non-urgent. • Non-urgent: patient that could be evaluated in the ED or elsewhere after more than 6 hours without risk of death.	31.2%
Bianco et al. [37]	Based on other studies	Italy	2003	Classified in 4 levels: extreme emergency, emergency, emergency as perceived by patient, and non-urgent. • Non-urgent: patient with no acute symptoms or the latter were recent and minor, without self-perceived emergency, wishing to have a check-up, renew a prescription, or excuse to return to work.	19.6%
Asia					
Shah et al. [31]		Kuwait	1996	Classified in 4 levels: emergency, urgent, marginally urgent, and non-urgent. • Non-urgent: in MD's assessment, did not present risk of death or did not require care within hours to decrease discomfort.	61%
Lee et al. [32]		China	2000	Classified as true urgency or not: • Non-urgent: could be managed as outpatients by GP, could wait several hours to be seen without risk of death or harm to patient.	57%
Others					
Rodríguez et al. [23]		Cuba	2001	Classified in 4 levels: first, second, and third priority urgency, and non-urgent. • Non-urgent: chronic disease problems, not acute-on-chronic, no risk of death in their evolution, could wait 24-48 hours to be treated by family doctor.	32.5%
Dent et al. [27]	Based on Australian Triage Scale (ATS)	Australia	2003	Classified as appropriate or inappropriate: • Appropriate: when referred by health professional classified from 1 to 3 on the Australian scale, required ≥ 4 hours of treatment or observation, was hospitalized or died, arrived between 10:00PM and 07:00AM. • Inappropriate (treatable by GP): other situations	59.5%
Finn et al. [40]	Protocol for evaluation of urgency	Australia	2006	Classified as appropriate or not: • Appropriate: could not be evaluated or managed by primary care or at patient's home. By definition, whenever patient was hospitalized, consider appropriate. • Inappropriate: all other situations	13.1%
Stein et al. [26]	Brazilian Federal Board of Medicine + dictionary	Brazil	2002	Classified in 3 levels: emergency, urgent, and non-urgent. • Elective consultation in ED: when could consult in > 24 hours.	39%

(continues)

Table 1 (continued)

Article	Protocol	Country	Year of publication	Criterion	Prevalence of inappropriate use
Others					
Carret et al. [13]	PAUH	Brazil	2007	Classified as urgent or not: • Urgent: criteria for severity of signs and symptoms, treatment, diagnoses, related to follow-up of consultation and extra criteria for patient not referred by MD. • Non-urgent: did not meet any of the above criteria.	24.2%

ED: emergency department; CTAS: Canadian Triage and Acuity Scale; PAUH: Hospital Urgencies Appropriateness Protocol; MD: Doctor of Medicine; GP: general practitioner.

The three studies that evaluated the association between means of transportation [12,16,26] and inappropriate use found varied results, which can be explained by the variation in each site's characteristics (size of the city, population's socioeconomic status, quality of mass transportation, and availability of ambulance services, among others). The majority of the studies that investigated proximity to the ED did not show a significant association with inappropriate use [14,16,32,37]. However, according to Oktay et al. [21], proximity to the ED was the principal reason for inappropriate complaints. Likewise, Young et al. [35] found that distance was one of the barriers to utilization of primary health care by individuals that visited the ED inappropriately.

Demographic variables

Sixteen studies showed an inverse association between age and inappropriate ED use [12,13,14,16, 19,21,22,23,25,30,31,32,33,34,37,42]. Only two studies [40,43] failed to show this association. In the first, the study population consisted of adults 65 years or older; the second, in addition to only comparing mean age in two groups, showed a lower score based on the Downs & Black criteria.

The association with gender was evaluated in 16 studies, eight of which [13,14,21,22,25,30,34,37] observed (in the multivariate analysis) that women showed higher odds of inappropriately visiting the ED. In the studies, the RR varied from 1.12 to 1.56. Carret et al. [13] stratified their sample in two age groups and only found this association in the younger groups (15-49 years) (RR = 1.52, p < 0.001).

Among those not showing an association with gender [12,16,19,23,31,32,40,43], five [16,19,23,31,43] only performed univariate analysis and/or showed a low score according to Downs & Black criteria and Finn et al only studied individuals 65 years or older [40]. Two other studies that did not show an association with gender were case-controls; however, they compared populations with similar health problems that chose to go to the ED or to the outpatient department, while the others compared individuals with inappropriate versus appropriate ED use [12,32]. The study by Shah et al. [31] was performed in Kuwait, where important cultural differences could explain this lack of association.

Of six studies that evaluated marital status [12,13,16,31,34,37], only Afilalo et al. [12] showed an association between living alone and appropriate ED use (p = 0.046). Five studies examined race or skin color, but since they categorized it differently it was impossible to summarize the results [13,25,30,34,43].

Socioeconomic variables

Three studies found a direct association between socioeconomic status (schooling [22,31] and income [21]) and inappropriate ED use [21,22,31]. Bianco et al. [37] showed a borderline direct association between schooling and inappropriate ED use (p = 0.052), as did Carret et al. [13] for the group 50 years or older (p = 0.06). Lee et al. [32] found no association between schooling and inappropriate use, but individuals that owned their own homes used the ED more inappropriately than those that consulted primary care for similar complaints.

Three studies found no association between socioeconomic status and the outcome [12,26,34], but Petersen et al. [34] compared groups with more (versus less) than 12 years of schooling and Afilalo et al. [12] only performed a univariate analysis for this association. Meanwhile, Sarver et al. [25], in a cohort study of a population that reported having a regular non-emergency source of care showed an inverse relationship between income and inappropriate ED use.

In most of the studies, occupational status was not associated with inappropriate ED use

Table 2

Characteristics of studies that evaluated factors associated with inappropriate use of the emergency department (ED).

Article	Year of publication	Country	Design	Sample	Field period	Associated factors	Score *
Baker et al. [45]	1995	USA	Cross-sectional	N = 1,190 (adults that arrived between 7:00AM and 11:00PM)	2 weeks (spring/1990)	No difference as to coming to ED on own, although those seen previously by MD and not referred showed more inappropriate ED use (p < 0.05).	6
Young et al. [35]	1996	USA	Cross-sectional, multi-center	N = 6,187 (patients with non-urgent complaints)	24 hours (June 1994)	**Characteristics of demand**: 39% self-reported urgent, 21% preferred ED due to better care or possibility of diagnosis and treatment, 50% reported non-financial barriers (primary care closed, nowhere else to go, difficulty or delay scheduling appointment, distance, transportation problems), and 15% reported financial barriers (no money or insurance, ED free or cheaper, required by insurance company, insurance paid for ED care). **RFA: univariate**: regular source of care (p < 0.001), referred by health professional (p < 0.001). No difference between complaints.	7.5
Petersen et al. [34]	1998	USA	Cross-sectional	N = 1.696 (≥ 16 years; with chest pain, abdominal pain, and asthma)	one month in each ED (1993)	**RFI: univariate**: not entered in the model: living alone, AIDS, depression, or gastric and renal diseases (p > 0.10). **Multivariate**: not having regular doctor (OR = 1.6, 95%CI: 1.2-2.2), female gender (OR = 1.3, 95%CI: 1-1.7), age < 16-30 years compared to > 60 years) (OR = 4.8, 95%CI: 3.4-7.0), pulmonary co-morbidities (OR = 0.5, 95%CI: 0.3- 0.6) and cardiac co-morbidities (OR = 0.6, 95%CI: 0.5-0.8). No association: skin color, no health insurance (OR = 1.0, 95%CI: 0.7-1.5), < 12 years of schooling (OR = 1.0, 95%CI: 0.8-1.4), married (OR = 0.9, 95%CI: 0.7-1.1), history of cancer (OR = 1.0, 95%CI: 0.6-1.7), history of diabetes (OR = 0.8, 95%CI: 0.5-1.1), history of hypertension (OR = 1.0, 95%CI: 0.8-1.3), overall health status (worse health) (OR = 1.0, 95%CI: 0.7-1.3)	8

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[12,13,25,34,43]. Lee et al. [32] showed protection against inappropriate use for individuals that worked part-time and for housewives, compared to those that worked fulltime. Pereira et al. [22] observed that retired women visited the ED 70% more appropriately than wage-earning women, even after adjusting for age.

Health needs

Some authors have reported that individuals without chronic non-communicable diseases or co-morbidities visit the ED more inappropriately [12,14,40], while others have found the same in a specific age group (50 years and older) [13] or in persons without specific co-morbidities (cardiac and pulmonary) [34]. The magnitude of the asso-

Table 2 (continued)

Article	Year of publication	Country	Design	Sample	Field period	Associated factors	Score *
Liu et al. [30]	1999	USA	Cross-sectional	N = 135,723	1992-1996	**RFI**: **multivariate**: ≥ 65 years (OR = 0.56, 95%CI: 0.53-0.58), men (OR = 0.89, 95%CI: 0.87-0.91), non-white (p = 0.001), place of residence (p < 0.001), urban area (OR = 0.95, 95%CI: 0.87-0.93) Diagnoses (comparison group: injuries and poisonings): diseases of the nervous system and sensory organs (OR = 1.85, 95%CI: 1.76-1.94), respiratory diseases (OR = 1.17, 95%CI: 1.13-1.22) and diseases of the digestive system (OR = 1.14, 95%CI: 1.09-1.20). As to health insurance: compared to private: Medicare (OR = 0.75, 95%CI: 0.72-0.79), Medicaid (OR = 1.14, IC19%: 1.11-1.18), HMO (OR = 1.02, 95%CI: 0.98-1.06), other (OR = 1.06, 95%CI: 1.03-1.09)	13
Sarver et al. [25]	2002	USA	Cohort	N = 9,146 (≥ 18 years, that reported having a regular source of care, not ED, and that had at least one contact in 1996 or did not succeed in consulting their primary care)	2 years (1996)	**RFI**: **multivariate**: age < 18-24 years compared to > 45 years): RR = 2.79, 95%CI: 2.00-3.84), women (RR = 1.44, 95%CI: 1.16-1.78), worse self-perceived health (RR = 2.94, 95%CI: 2.06- 4.11), lower income (RR = 1.70, 95%CI: 1.20-2.39), lower satisfaction with primary care (score 0-4: RR = 1.13, 95%CI: 1.01-1.25) and more difficult access to primary care (p = 0.029). No association with race (p = 0.422), health limitation (p = 0.553), lower schooling (p = 0.83), employment status (p = 0.301), type of health insurance (p = 0.167), living in rural area (p = 0.257), and place of residence (p = 0.138), difficulty scheduling with primary care (p = 0.06), difficult phone contact with primary care (p = 0.297), longer waiting time for consultation (p = 0.258)	12

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ciation varied from 1.5 to 2.0. Meanwhile, Bianco et al. [37] and Carret et al. [13], among adults younger than 50 years, and Peterson et al. [34], studying other co-morbidities (cancer, diabetes mellitus, systemic arterial hypertension), found no association with inappropriate ED use.

In relation to self-perceived health, three authors [12,13,34] found no association with the outcome. However, Sarver et al. [25] pointed out that individuals with worse self-perceived health had nearly three times more inappropriate ED visits than those with good to excellent self-perceived health, but in this case self-perceived health was assessed outside the ED.

Access to health services

• **Cost and form of payment for care**

According to three authors, cost of the consultation was associated with inappropriate use. Oktay et al. [21] found that those who paid for the consultation used the ED 60% more appropriately than those who did not pay. Lee et al. [32] attributed the preference for using primary care (rather than the ED) for outpatient complaints to the lower cost of primary care, while Young et al. [35] ascribed higher inappropriate ED use to the fact that it cost less.

Table 2 (continued)

Article	Year of publication	Country	Design	Sample	Field period	Associated factors	Score *
Afilalo et al. [12]	2004	Canada	Cross-sectional	N = 1,783 (≥ 18 years)	October 1999 to May 2000	**RFI**: **univariate**: older (p = 0.01), live less alone (p = 0.045), visited less after hours (4:00PM-08:00AM), came to ED less by ambulance (p = 0.0026), less self-perceived urgency (p = 0.0067), better self-perceived overall health (p = 0.016), fewer co-morbidities (p = 0.023), and less hospitalization in previous 3 years (p = 0.0029), took longer to come to ED. No difference in gender, schooling, marital status, immigration, employment status, day of week, being followed by primary care or specialist. **Most frequent complaints among non-urgent ED users**: abdominal pain and chest pain. **Reasons for ED rather than primary care**: ease of access (32%), trust (7%) familiarity (11%), and no reason (7%). **RFI**: comparing the 5 hospitals. **Multivariate**: (after adjusting for age, income, number of beds, and urban area, compared different hospitals): only visit during business hours, less use of ambulance, and lower self-perception of urgency were associated with non-urgency (results same as univariate)	10
Fajardo-Ortiz & Ramirez-Fernández [28]	2000	Mexico	Cross-sectional	N = 26,005 (≥ 15 years)	1 year (1996)	**Ratio between real urgency and non-urgent**: 9:00PM-7:59AM (ratio = 1/0.95), 8:00AM-2:29PM (ratio = 1/1.39), 2:30-8:59PM (ratio = 1/1.87), and 8:00AM-8:59PM Saturday, and 08:00AM Sunday-07:59AM Monday (ratio = 1/3.31)	6
Dale et al. [19]	1995	UK	Cross-sectional	N = 2,648 (patients of all ages)	1 year (June 1989 to May 1990)	**RFI**: **univariate**: younger age (p < 0.001), > duration of symptoms (p < 0.001), contacted health professional before coming to hospital (p < 0.001), less radiological investigation (p < 0.001), blood tests (p < 0.001), other lab tests (p < 0.001), and microbiological tests (p = 0.007), and ED follow-up (p < 0.001). No difference by gender (p = 0.163). Diagnoses among inappropriate users, compared to appropriate: musculoskeletal complaints, (p = 0.028), infections (p = 0.002), skin diseases (p < 0.001), genitourinary diseases (p = 0.04). Diagnoses among appropriate users: injuries (p < 0.001) and psychiatric complaints (p = 0.035). No difference for cardiovascular diseases (p = 0.09), respiratory (p = 0.138), obstetric or contraception (p = 0.26), ocular diseases (p = 0.567), gastrointestinal (p = 0.17)	7

(continues)

Table 2 (continued)

Article	Year of publication	Country	Design	Sample	Field period	Associated factors	Score *
Rajpar et al. [43]	2000	UK	Case-control	N = 54 non-urgent ED patients and 48 outpatients, off hours, all ages)	12 three-hour sections	**RF for seeking ED rather than primary care**: whites (compared to Asians) (p < 0.01) and younger. No difference by gender, employment status (p > 0.05). Not significant difference for mean age (0-80 years); but when observed by age brackets, the 21-40- year group used the ED the most for off-hours primary care consultations. Reasons for using ED inappropriately (among 54 patients): primary care closed (50%), but 46.3% did not even attempt contact with primary care and 22% perceived situation as urgent.	5
Coleman et al. [33]	2001	UK	Cross-sectional	N = 255 (adults with green and yellow cards)	7 weeks (October-December 1997)	**Characteristics of non-urgent patients**: mean 34 years, 81% self-referred, 80% trauma, 20% non-trauma, ¼ of problems occurred at home, 2/3 came from home. **Main reason for visiting ED**: believe they needed X-ray and to be oriented by someone.	8
Oterino et al. [14]	1999	Spain	Cross-sectional	N =1,845 (≥ 15 years)	1 year (1996)	**RFI**: univariate: no association with distance, day of week, and shift when arrived at ED. **Multivariate**: age < 79 years: OR = 0.33, 95%CI: 0.20-0.55), women (OR = 1.51, 95%CI: 1.16-1.94), no chronic diseases (OR = 1.91, 95%CI: 1.43-2.54), came to ED on own (OR = 1.39, 95%CI: 1.07-1.80), and consulted during the 3:00PM-midnight shift, compared to early morning hours (OR = 1.66, 95%CI: 1.12-2.46), with the following associated diagnoses (comparison category: infectious diseases): skin diseases (OR = 4.95, 95%CI: 2.05-11.93), psychiatric complaints (OR = 2.54, 95%CI: 1.19-5.40), musculoskeletal (OR = 2.60, 95%CI: 1.25-5.38), ill-defined signs and symptoms (OR = 1.91, 95%CI: 1.13-3.46), nervous system and sensory organs (OR = 0.21, 95%CI: 0.09-0.45), circulatory system (OR = 0.29, 95%CI: 0.15-0.57), respiratory (OR = 0.35, 95%CI: 0.18-0.65), injuries and poisonings (OR = 0.36, 95%CI: 0.14-0.89). No relation to (compared to infection) diagnosis of neoplasm, endocrine diseases, hematological diseases, digestive, and genitourinary.	9

(continues)

After adjusting for possible confounding factors, four studies [13,22,25,34] found no association between not having a health plan and inappropriate ED use, two of which [13,22] were conducted in countries with public health care systems and two in countries without such a system [25,34]. Liu et al. [30] found varied associations, depending on the person's type of insurance.

Table 2 (continued)

Article	Year of publication	Country	Design	Sample	Field period	Associated factors	Score *
Sempere-Selva et al. [16]	2001	Spain	Cross-sectional	N = 2,980	1 year (May 1996 to April 1997)	**RFI: univariate**: younger age, came by car, referred by hospital, reside in specific areas of the city, certain months of the year, were out of their area of consultation. No association with gender, living alone, distance from hospital, referred by health professional, or came on own. Symptoms: principally ocular, allergic reactions, conjunctivitis, hearing and other sensory complaints. Among inappropriate ED users, 16% had been referred by MD. Among inappropriate users who came on own, 9.4% reported difficulty in obtaining access to other services, 9% due to lack of information on alternative sources of care. Main reason was greater trust in ED than in primary care.	9.5
Pereira. et al. [22]	2001	Portugal	Cross-sectional	N = 5,818 (≥ 13 years)	12 days (February-June 1998)	**RFA: univariate**: men (OR = 1.28, 95%CI: 1.14/1.44, p < 0.001) and all in multivariate. No association with "kind of insurance" (p = 0.465) or day of week (p = 0.814). **Multivariate**: gender had modifying effect (interaction with having job, schooling, and duration of symptoms). Women: ≥ 60 years (OR = 1.7, 95%CI: 1.0-2.9), retired compared to wage-earning (OR = 1.7, 95%CI: 1.0-2.7), visits from midnight to 08:00AM (OR = 2.5, 95%CI: 1.4/5.4) symptoms ≤ 24 hours (OR = 2.7, 95%CI: 2.1-3.7). Men: ≥ 60 years (OR = 2.3, 95%CI; 1.5-3.9), symptoms ≤ 24 hours (OR = 4.0, 95%CI: 2.9-5.3)	12
Bianco et al. [37]	2003	Italy	Cross-sectional	N = 541 (≥ 15 years)	2 weeks + 1 weekend, 08:30AM-02:00PM and 03:00-07:00PM (July-December 2001)	**RFI: univariate**: No difference in gender (p = 0.12), marital status (p = 0.15), schooling (p = 0.89), number of persons per household (p = 0.5), distance from home to ED (p = 0.052), presence of chronic non-communicable diseases (p = 0.09), day of week (p = 0.18), time of arrival at ED (p = 0.94). **Multivariate**: younger age (p < 0.001), women (OR = 1.56, 95%CI: 1.0-2.51), not referred by physician (OR = 2.42, 95%CI: 1.13-5.16), longer duration of symptoms (OR = 1.78, 95%CI: 1.23-2.58). No relationship to schooling (does not specify direction, p = 0.052), number of persons in household (p = 0.357), distance from home to ED (p = 0.39), chronic non-communicable disease (p = 0.376), day of week (p = 0.258)	10

(continues)

Table 2 (continued)

Article	Year of publication	Country	Design	Sample	Field period	Associated factors	Score *
Oktay et al. [21]	2003	Turkey	Cross-sectional	N = 1,155 (17-99 years)	14 days (November 1998)	**Univariate**: beyond multivariate associations, > schooling (p < 0.001). **RFA**: **multivariate**: older age (OR = 1.02, 95%CI: 1.02-1.03), women (OR = 0.66, 95%CI: 0.50-0.86), pay for consultation (OR = 1.60, 95%CI: 1.20-2.12), lower income (no income with OR = 1.77, 95%CI: 1.25-2.50). No association with schooling. Reason for preferring ED among inappropriate users: proximity to ED, satisfaction, worsening of symptoms, and difficult access to clinical care.	10
Shah et al. [31]	1996	Kuwait	Cross-sectional	N = 2,011 (6 EDs)	07:30AM-09:00PM (January-February 1993)	**RFI**: **univariate**: younger age (p < 0.001), men (p < 0.01), married and single (p < 0.001), more schooling (p < 0.001), not enrolled in primary (p < 0.001). No association with income (p > 0,05), born in Kuwait (p > 0.05), preference for ED or primary care as usual source of care (p > 0.05). **Multivariate**: age (> 50 years – OR = 0.56, p = 0.0042, compared to < 25 years), > schooling (OR = 1.73, p = 0.0001), no enrolled in primary care (OR = 1.39, p = 0.0118), and no self-perceived urgency (OR = 3.81, p < 0.0001). Not related to male gender (OR = 0.93, p = 0.51), marital status (p = 0.29), born in Kuwait, income, preference for ED/primary care as regular source of care (OR = 0.96, p = 0.75). In multivariate, the income bracket just above the very poor showed significantly more inappropriate ED use than the very wealthy, (OR = 1.45, p = 0.02)	8
Lee et al. [42]	2001	China	Cross-sectional	N = 2,410 (4 EDs)	1 year (1997)	**RFI**: **univariate**: < age (p < 0.001). No significant difference in time of arrival at ED. The article later concludes that the highest inappropriate use rates occur in late afternoon and early morning. Principal causes of inappropriate use were respiratory complaints (principally in younger patients) and digestive complaints.	8

(continues)

- **Regular physician and regular health care facility**

In two studies, individuals with a regular physician showed 40 and 67% less inappropriate ED use, respectively [26,34]. In the same sense, two other studies showed that individuals with a link to primary health care used the ED more appropriately [31,35]. However, four studies found no such associations for regular physician [13,32] or regular source of care [12,13,26]. This lack of association may be related to the more rigorous criteria for defining inappropriate use [12,13] and the low precision of the multivariate analysis, suggested by wide confidence intervals found in one of the studies [32]. In addition, aspects not shown in the data analysis could explain the fact that Stein et al. [26] found an association between the outcome and regular physician, but not with regular source of care, such as colinearity between these two variables if they were evaluated at the same time in the analysis.

Table 2 (continued)

Article	Year of publication	Country	Design	Sample	Field period	Associated factors	Score *
Lee et al. [32]	2000	China	Case-control	726 cases (4 EDs) and 726 controls (2 outpatient services)	1 year (1997)	RFI: univariate: younger age and proximity too ED (p < 0.01). No difference in gender (p = 0.2). Case-control: Variables evaluated: own home, schooling, regular doctor, occupational status, reasons for non-urgent patients to prefer ED to primary care. Multivariate: age 0-9 years compared to ≥ 65 years (OR = 5.44, 95%CI: 1.6-18.2), part-time workers or housewives (OR = 0.38, 95%CI: 0.19-0.78). Reasons for preferring ED to primary care: greater efficiency in diagnosis, greater self-perceived urgency, primary care closed, desperate for help. Lower cost associated with lower odds of inappropriate ED use. No association with proximity to ED	13
Finn et al. [40]	2006	Australia	Cross-sectional	N = 541 (≥ 65 years, living in homes for elderly)	January 1st to June 30rd, 2002	RFA: multivariate: prior consultation with primary care physician or substitute physician (p = 0.02), more clinical interventions, longer time in ED (p < 0.001), lower survival rate (p = 0.02). No difference: age (p = 0,93), gender (p = 0.96)	8
Rodríguez et al. [23]	2001	Cuba	Cross-sectional	N = 1,360 (≥ 15 years, ED and polyclinic)	5 days (1995)	**RFI**: **univariate**: younger age (p < 0.001), business hours (p < 0.001). No difference in gender (p > 0.05).	7.5
Stein et al. [26]	2002	Brazil	Cross-sectional	N = 553	20 days (January-June 1996)	**RFA**: **multivariate**: Controlling for demographic and socioeconomic variables, means of transportation, distance to ED, who referred patient to ED, regular source of care, set of symptoms, regular doctor (OR = 2.98, 95%CI: 1.84-4.80), and having come by car (OR = 2.67, 95%CI: 1.75-4.05)	8.5

(continues)

Referral

According to Coleman et al. [44], two-thirds of patients with inappropriate complaints came directly from home. Five studies showed that individuals who went to the ED on their own had 1.39 to 2.42 times greater odds of using the ED inappropriately, as compared to those referred by a health professional [13,14,35,37] or other hospitals [16]. Meanwhile, two authors [26,45] did not find this association, but Barker et al. [45] observed that patients who had been seen previously by a physician but not referred showed more inappropriate use.

• Prior consultation for the current complaint

The findings related to having a prior outpatient consultation are contradictory. An Australian study [40] found that individuals in an aged care facility who had prior contact with a physician for their current problem consulted the ED more appropriately (p = 0.02). Meanwhile, Dale et al. [19] found that patients who had prior contact with a health professional for their current complaint had more inappropriate ED visits (p < 0.001). Carret et al. [13], in a multivariate analysis, showed no such association.

Table 2 (continued)

Article	Year of publication	Country	Design	Sample	Field period	Associated factors	Score *
Carret et al. [13]	2007	Brazil	Cross-sectional	N = 1,647 (≥ 15 years)	September 2004	**Characteristics of inappropriate use**: time of day: morning (RR = 1.46, 95%CI: 1.02-2.10), afternoon (RR = 1.29, 95%CI: 0.90-1.85), evening (RR = 1.16, 95%CI: 0.81-1.68), early morning (reference category), longer duration of symptoms ($p < 0{,}001$), longer waiting time in waiting room ($p < 0.001$). **RFI**: lower age; age acted as effect modifier (interaction $p = 0.04$). **RFI for 15-49-year bracket**: female gender (RR = 1.52, 95%CI: 1.23- 1. 88), having reported difficulty in scheduling appointment with primary care as reason for visiting ED (RR = 1.38, 95%CI: 1.01-1.89), report fewer shifts during which primary care is open ($p = 0.009$), reports that primary care physician refuses to treat without scheduling appointment (RR = 1.44, 95%CI: 1.02-2.02), not referred by health professionals (RR = 1.40, 95%CI: 1.01-1.94). No association with skin color, marital status, schooling, chronic non-communicable disease, self-perceived health, having visited primary care previously, regular doctor, social support. **RFI in ≥ 50-year bracket**: absence of chronic disease (RR = 1.50, 95%CI: 1.03-2. 17), lack of social support (RR = 1.40, 95%CI: 1.01-1.95). No association with gender, skin color, marital status, more schooling ($p = 0.06$), having visited primary care first, regular doctor, difficulty scheduling appointment with primary care, number of shifts in which primary care is open, primary care physician refuses to treat without scheduling appointment, who referred patient to ED	13

* Quality score according to Downs & Black [11].

RF: risk factor; RFA: risk factor for appropriate use; RFI: risk factor for inappropriate use; HMO: health maintenance organization.

Reasons for preferring the emergency service

• **Access**

The four descriptive studies that evaluated the access-related reasons for preferring the ED detected difficulties in consulting primary care, such as the primary care facility being closed, difficulty in obtaining an appointment, and waiting time as reasons for inappropriate ED use [12,13,16,21,32,35,43]. Lee et al. [32] and Rajpar et al. [43] found that 35% and 50% of patients, respectively, reported closed primary care facilities as one of the reasons for inappropriate ED use, but in the latter 46.3% had not even attempted contact with primary care.

Two analytical studies found an association between difficult access to primary health care and inappropriate ED use. In the cohort study in the United States, this association had a p of 0.029. The variables comprising this indicator, difficulty in scheduling primary care, difficult telephone contact for primary care, and longer waiting time for a primary care appointment were also associated with inappropriate ED use ($p < 0.03$) when evaluated singly in the multivariate analysis [25]. Meanwhile, in the Brazilian study, difficulty in obtaining a primary care appointment, refusal by the primary care physician to

treat patients without a previously scheduled appointment, and primary care being open for shorter hours were associated with inappropriate ED use in the 15-49-year bracket (RR = 1.38, 1.44, and 1.63, respectively) [13].

• **Characteristics of ED use**

Ease in obtaining diagnostic tests and treatments at the ED were other reasons cited for preferring the ED [32,33,35,43]. Rajpar et al. [43] and Lee et al. [32] reported that 3.7% and 11.4%, respectively, preferred the ED due to greater ease of diagnosis. Young et al. [35] reported that 21% of patients chose the ED claiming better care or greater ease of diagnosis and treatment. Carret et al. [13], in a multivariate analysis, found no association between difficulty in obtaining tests, medicines, and referral to specialists through primary care and inappropriate ED use.

Sempere-Silva et al. [16] pointed to trust in the service provided by the ED as the principal reason for inappropriate use of this service, while in Afilalo et al. [12], 7.1% of patients cited this reason. Sarver et al. [25], in a multivariate analysis, found that the greater the dissatisfaction with primary care, the greater the inappropriate use of the ED (RR = 1.13 per unit, in a score ranging from 0 to 4; 95%CI: 1.01-1.25).

Principal diagnosis

The principal diagnoses found in persons that visited the ED inappropriately varied considerably from study to study, depending on the classification used in the target age bracket. Three descriptive studies indicated that the principal diagnosis or complaints among persons that consulted the ED inappropriately were respiratory problems (especially in younger patients) and digestive problems [42]; abdominal pain and chest pain [12], and eye and ear complaints [16].

In studies on association, Lui et al. [30] found that neurological and sensory organ complaints and respiratory diseases showed odds ratios of 1.85 (95%CI: 1.76-1.95) and 1.14 (95%CI: 1.09-1.20), respectively, of inappropriately consulting the ED among those who visited the ED with injuries and poisoning. Meanwhile Oterino et al. [14] used as their comparison group those who visited the ED for infectious diseases and found more inappropriate visits among patients with skin diseases (OR = 4.95; 95%CI: 2.05-11.93), musculoskeletal diseases (OR = 2.60; 95%CI: 1.25-5.38), mental health problems (OR = 2.54; 95%CI: 1.19-5.40), and ill-defined signs and symptoms (OR = 1.91; 95%CI: 1,13-3.46), while neurological and circulatory diseases showed the least inappropriate use [14].

Dale et al. [19], in a univariate analysis, found that musculoskeletal diseases (p = 0.028), infections (p = 0.002), skin diseases (p < 0.001), and genitourinary diseases (p = 0.04) were more frequent in inappropriate (as compared to appropriate) ED use.

Discussion

The prevalence and factors associated with inappropriate ED use varied widely, depending mainly on the criteria used and the study population. The criteria often underestimate inappropriate ED use. This occurs when using self-perceived urgency as the criterion [6,37] or when the criteria define as appropriate all cases requiring intravenous medication or any type of complementary test [13,14,16,36,41]. In this situation, the definition ends up including problems that require immediate attention, but which occur when the primary health care facility is open and operating and could thus be resolved at this level of care (as in the frequent case of patients with fever, high blood pressure, dysuria, and other complaints).

This literature review indicates that despite the above caveats, the prevalence of inappropriate ED use was consistent in a large number of studies, even across countries with different health care systems. The studies point to a high prevalence (from 20 to 40%), concentrated more in daytime ED visits. The principal factors associated with inappropriate ED use were younger age, female gender, absence of co-morbidities, lower health spending, not being referred by a health professional, not having a regular physician or regular source of care, and difficulty in accessing primary care. No association was found between marital status, occupational status, or self-perceived health and inappropriate ED use. The associations with other variables such as race or skin color and prior consultation for the current complaint showed varied and sometimes contradictory results.

The associations between younger age and female gender and inappropriate ED use were highly consistent [13,14,21,22,25,30,34,37]. Among the elderly, the prevalence of chronic non-communicable diseases is high. In this group, ED use is considered appropriate in most cases, even in situations that could be managed at more basic levels of care, since even in such cases the patients end up having complementary tests or receiving IV medication [9,46]. As for female gender, the association could be explained by the fact that women use health services more in general and maintain this same trend with inappropriate ED use [47].

The studies point to a direct association between socioeconomic status and inappropriate ED use [21,22,31]. This finding is plausible, since higher-income individuals have greater access to health services in general, suggesting health inequity [47]. This ends up aggravating health inequity since higher-income individuals occupy the ED with inappropriate complaints, thereby limiting access by the lower-income population that not only has greater health needs but also comes to the ED more often for truly urgent problems. Inequity also reduces the emergency department's efficiency, since patients that most need ED services are the ones with the least access. The lack of association with socioeconomic status in some studies might be related to: methodological specificities, especially in data analysis with only two categories or with a high cutoff point for the schooling variable, thus hindering the identification of associations or impeding evaluation of tendencies [34]; the use of only univariate analysis [12]; inclusion of all the variables at the same time in the analytical model, causing adjustment for mediating variables; or colinearity between income and schooling and underestimating the effect [48].

The negative association between presence of co-morbidities and inappropriate ED use appears to be related to greater health needs in these cases, which require more detailed examination by the physician. Thus, most cases of co-morbidities ended up being classified as urgent [9]. In addition, as Petersen et al. [34] showed, the association between chronic disease and inappropriate ED use appears to vary according to the type of chronic disease. Carret et al. [13] only found a negative association between presence of chronic non-communicable diseases and inappropriate ED use in the elderly. In younger patients this association was not found, perhaps due to lack of statistical power, either because chronic diseases are less prevalent in the younger age brackets or because the elderly present chronic diseases of a different type or severity. This age effect modification may explain the fact that some authors did not find an association when they studied populations that included young adults [13,37].

The majority of the authors did not find an association between self-perceived health and inappropriate ED use. The only author that found an association between poor self-perceived health and inappropriate ED use collected this variable in a household setting [25]. These findings indicate that measurement of self-perceived health in the ED is heavily affected by the moment in which this question is asked, and that it is difficult to interpret. This measurement of self-perceived health does not appear to reflect the way individuals assess their overall health status, an aspect that relates more to the way health services are used.

In relation to factors associated with access to the ED, it was clear that the cost concern influences the decision about the place of consultation. This is reinforced by studies we reviewed showing that individuals seek levels of care with the lowest cost and consult the ED less inappropriately when they have to pay [31,32,35]. Some studies that evaluated the relationship between health plan coverage (yes versus no) and inappropriate ED use did not find such an association [13,22,25,34], while according to Liu et al. [30] the association can vary according to the type of health plan. The findings suggest that individuals with high income and excellent health plans rarely consult the ED, that they have easy access to their regular physicians and services even outside of business hours, and that if necessary they can even be admitted to hospital without going through the ED. Meanwhile, individuals with health plans that impose a wide range of limitations on both coverage and speed of access appear to be similar to users of the public health system in terms of inappropriate ED use.

The same logic applies to the regular physician and regular source of care. To avoid inappropriate use, it appears not to be sufficient to have a fixed physician and regular source of care; rather, this physician or service must be easily and quickly accessible [49]. In addition, the regular doctor and regular source of care appear to have a greater impact on reducing inappropriate ED use in cases involving doubt about urgency. This is reinforced by the fact that studies showing an association between regular physician/regular source of care and inappropriate ED use used a less rigorous criterion for defining such use [31,34,35] as compared to studies that found no such association [12,13]. The importance of having access to physicians at other levels of care is also demonstrated by the consistency of the positive association between referral by a health professional and appropriate ED use [13,14,35,37].

Another aspect evaluated was prior consultation for the current complaint, which did not show consistent findings. One reason for this inconsistency was the fact that the studies evaluated different populations, such as residents of homes for the elderly, who may often even need an authorization from the institution's physician to be referred to the ED [40]. Another relevant aspect is the imprecision in defining exposure, i.e., failure to specify the time during which the prior consultation for the current complaint occurred, and the difficulty in demarcating the current complaint, thus hindering interpretation of the findings.

Most of the studies on reasons for preferring the ED are descriptive [16,21,35,43]. The small number of studies of association on reasons for preferring the ED help explain the scarcity of accumulated knowledge on the subject. The existing studies suggest that difficulty in access to primary health care is an important factor for inappropriate ED use [12,13,16,21,32,35,43], although the difficulty is not simply the availability of primary care services (because the prevalence of inappropriate ED use increases during the day, when primary care is operating), but the possibility of obtaining care quickly [3,49]. Patients think it is so unlikely that they will get a timely primary care appointment that many do not even try [49]. They fact that they receive tests and treatment during the ED visit and their trust in the services provided by the ED are important enticements for choosing the ED [32,35,43]. However, typical difficulties in primary health care such as delays in performing tests and obtaining medicines and referrals to specialists were not associated with inappropriate ED use [13]. Rather, this outcome was associated with dissatisfaction over primary care [25].

Inappropriate ED use occurs in various parts of the world, thereby increasing costs and hindering access to the ED for really urgent cases [3,50]. In addition, non-urgent cases are managed hastily and fail to benefit from the comprehensive care and continuity they could obtain at other levels of care [49].

There are various studies on inappropriate ED use, but the diversity of criteria used limits the comparability of findings. Nevertheless, the socio-demographic profile of the population that consults the ED inappropriately is well defined. Meanwhile, most available studies on the reasons for consulting the ED inappropriately are descriptive, so these aspects have not been fully clarified.

This review indicates that access to primary health care plays a key role in reducing inappropriate ED use. However, intervention studies have already demonstrated that expanding the amount of services, business hours, and health professionals in primary care does not have a major impact in reducing inappropriate ED use [10,51]. This study suggests that primary care needs to provide high-quality reception of patients, with efficient triage so as to treat cases quickly when they cannot wait [4,49]. In countries with a public health care system, like Brazil, this can be facilitated by continuity in health care, since the primary care team establishes a bond and takes responsibility for the population in its coverage areas and is thus better prepared to provide adequate reception and efficient triage. In parallel, it is important to inform the population on situations in which they really should use the ED and the disadvantages of consulting the ED when the case is not truly urgent [5]. The emergency department, in turn, should develop a counter-referral system to make the tests, diagnoses, and prescriptions performed by the ED available to the other levels of care, in order to improve the care in general and avoid repeating unnecessary tests. Other measures are needed with specific populations, like those that consult the ED repeatedly ("frequent flyers"), aimed at redirecting them to other levels of care, thereby helping minimize the problem.

Future studies, especially on association, with standardized criteria to characterize inappropriate ED use, with in-depth investigation of the reasons leading the population to use emergency services inappropriately, can help establish strategies to reduce the problem. Intervention studies will also be needed to test the proposed strategies. In-depth development is also needed for criteria to define inappropriate use in order to better discriminate between cases that may need immediate attention but can be managed by primary care and those that not only require immediate attention but also require procedures not available in primary care facilities.

Resumo

Esta revisão sistemática objetivou medir a prevalência e fatores associados ao uso inadequado do serviço de emergência, em adultos. Foram incluídos 31 artigos publicados nos últimos 12 anos. A prevalência de uso inadequado variou principalmente entre 20 e 40% e foi diretamente associada à idade e nível econômico. Mulheres, pessoas sem co-morbidades, menor gasto em saúde, sem médico regular ou local regular de cuidado e que consultavam por conta própria também consultavam mais inadequadamente com risco relativo variando entre 1,12 e 2,42. Dificuldades de acesso à atenção primária à saúde, como dificuldade de agendamento, maior time de espera para consultar e o local de atenção primária ficar menos time aberto por dia, também estiveram associados com uso inadequado. Esta revisão indica que problemas no acesso à atenção primária à saúde são determinantes de uso inadequado. Assim, a atenção primária à saúde necessita realizar um acolhimento qualificado, com uma triagem eficiente de forma a atender rapidamente os casos que não podem esperar. Além disso, é preciso esclarecer a população acerca das situações em que devem procurar o serviço de emergência e sobre as desvantagens de se consultar no serviço de emergência quando o caso não é realmente urgente.

Serviços Médicos de Emergência; Mau Uso de Serviços de Saúde; Adulto; Estudos de Avaliação

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