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Evaluación del uso inapropiado de los servicios de emergencia de un hospital del seguro social en Lima, Perú.

Jorge De La Cruz-Oré dj.jdo.fmh@gmail.com
National Hospital Guillermo Almenara, Lima, Perú

Resumen: Se denomina uso inapropiado de los servicios de emergencia a la búsqueda de servicios de salud de manera urgente por parte de los pacientes que presentan una patología no urgente, cuyo problema de salud puede y debe ser atendido en el nivel primario o por consultorio externo. El objetivo planteado fue el de encontrar ciertas características que pudieran ser relevantes a la hora de hacer uso inapropiado de los servicios de emergencia. Estudio transversal analítico en el que se administró un cuestionario por medio de entrevista para realizar una encuesta a una muestra aleatoria de usuarios del servicio de emergencia del Hospital Nacional Guillermo Almenara que cumplían con los criterios de selección desde abril a noviembre del 2015. El análisis bivariante identificó siete variables significativas relacionadas al uso inapropiado, con *OR* [IC 95 %] y valor *p*: género femenino (1.49 [1.07, 2.08], *p* = .018), presencia de enfermedad crónica (0.50 [0.35. 0.72], *p* < .001), percepción de ausencia de equipos en nivel primario (2.56 [1.66, 3.94], *p* < .001), percepción de ausencia de especialistas en nivel primario (2.25 [1.43, 3.55], *p* < .001), autorreferencia (1.69 [1.12, 2.57], p = .012), percepción de que la atención del nivel terciario cuesta igual o menos (2.02 [1.42, 2.89], *p* < 0.001), encontrarse en el trabajo al momento de decidir acudir a emergencia (1.87 [1.12, 3.13], *p* = 0.015). El análisis multivariante identificó tres variables significativas, con *ORaj* [IC 95 %] y valor p: percepción de ausencia de equipos en nivel primario (2.21 [1.42, 3.44], *p* < .001), autorreferencia (1.72 [1.05, 2.77], *p* = .032) y percepción de menor costo (2.0 [1.35, 3.09], *p* = .001). La presencia de enfermedad crónica, la percepción de ausencia de equipos y de especialistas en nivel primario fueron las variables que se asociaron con mayor fuerza al uso inapropiado de los servicios de emergencia.

Palabras clave: Servicios médicos de urgencia, servicios de salud, mal uso de los servicios de salud.

Abstract: Inappropriate use of emergency services is defined as the misuse of emergency room services for pathologies that could be attended as a non-urgent basis, either at an outpatient or in primary services. The purpose of this research was to find some characteristics associated with this misuse. Analytical cross-sectional study, in which a random sample of users of the emergency service of the National Hospital "Guillermo Almenara" who met the selection criteria from April to November 2015, was administered. The bivariate analysis identified seven significant variables related to the inappropriate use: female gender (OR = 1.49, 95% CI [1.07, 2.08], *p* = .018), presence of chronic disease (OR = 0.50, 95% CI [0.35, 0.72], *p* < .001), perception of absence of equipment at primary level (OR = 2.56, 95% CI [1.66, 3.94], *p* < .001), perception of absence of specialists at primary level (OR = 2.25, 95% CI [1.43, 3.55], *p* < .001), self-reference (OR = 1.69, 95% CI [1.12, 2.57], *p* = .012), perception that the tertiary level care costs equal or less (OR = 2.02, 95% CI [1.42, 2.89], *p* < .001), and being at work when deciding to go to emergency (OR = 1.87, 95% CI [1.12, 3.13], *p* = .015). The multivariate analysis identified three significant variables: perception of absence of equipment at primary level (Adj. OR = 2.21, IC95% [1.42, 3.44], *p* < .001), self-reference (Adj. OR = 1.72, 95% CI, [1.05, 2.77], p = .032), and lower cost perception (Adj. OR = 2.0, 95% CI [1.35, 3.09], p = .001). The presence of chronic disease, the

perception of lack of equipment, and specialists at the primary level were the variables that were most strongly associated with the inappropriate use of emergency services.

Keywords: Emergency medical services, health services, health services misuse.

Introduction

Emergency services are special units, designed to provide highly professional medical treatment and distinguished by its immediate availability of special resources for patients that require urgent care at any time or day of the year (Hansagi, Olsson, Sjöberg, Tomson, & Göransson, 2001).

Non-urgent care in emergency services is defined as services provided to pathologies that do not increase the possibility of adverse results upon health if there is a long hour delay for treatment. (Uscher-Pines, Pines, Kellermann, Gillen, & Mehrotra, 2013).

Inappropriate use of emergency services (IUES) refers to a health service selection by patients that present a non-urgent pathology, a health issue that can and should be treated in primary care or outpatient clinic. This inappropriate use is turning into a serious issue and spreading globally, both in public health and in private systems (Uscher-Pines et al., 2013).

This prevents from providing proper healthcare access for actual emergency cases, produces negative effects in the quality of emergency services and increases healthcare costs (Oktay, Cete, Eray, Pekdemir, & Gunerli, 2003). It´s been shown that the use of primary care physicians to treat non-urgent problems is economically more profitable without increasing adverse effects upon health (Sánchez-López & Bueno-Cavanillas, 2005).

Emergency services in hospitals of high complexity level in the country are being outnumbered for several years now due to the influx of people that go in order to have their health issues solved, which many times do not represent real emergencies, but minor urgencies and even pathologies that usually should be treated in an outpatient clinic (Mamani, Obando, Uribe, & Vivanco, 2007; Ugarte, 2000).

Possible causes of the inappropriate use of emergency services have been researched in different parts of the world, showing different results according to the used methodology, reality and studied geographical place. Regarding to the problem put forward, there is not any research reports in Peru. This is why the results in the following study can contribute with necessary information to mitigate the critical effects that the inappropriate use by patients and healthcare workers produce. The objective of this study was to find variables associated to the IUES through a survey application to a systematic sample of patients that went to the emergency service in the hospital for two months, duration of this study.

Materials y methods

Study design
   Analytical cross-sectional study
   Sample
   The sample was taken among patients that went, from 8AM to 8PM, to emergency at the National Hospital Guillermo Almenara, a tertiary referral hospital in Peru city belonging to the social security system, which makes it one of the main hospitals from a national network of healthcare facilities in Peru. In order to calculate the sample size, it was followed the recommendations by Peduzzi, based on logistic aggression simulations, according to which a number of 10 events for each variable considered in this study is required. (Peduzzi, Concato, Kemper, Holford, & Feinstein, 1996). In this study, an event is defined as a case of inappropriate use of emergency services. Given the fact that a total of 16 explanatory variables are being considered, it is needed a minimum of 160 events within the sample. An estimation of 34% of non-urgent healthcare services was obtained from the records of the emergency department. Therefore, it is required a minimum sample of n = (160*100)/34 = 471 individuals. Patients were systematically selected, ten by ten as they were arriving and from the beginning of every survey session. As for survey days, they were randomly selected between eight months, from April until November of 2015.
   Criteria for the selection of participants
   Surveyed patients were those admitted to on-call medical services, surgery and traumatology. Patients in on-call pediatric services and obstetrics-gynecology services were excluded. When the patient refused to participate, the next one was chosen and every 10 patients were then selected again from there.
   Variables
   The relation between 16 variables with the IUES was evaluated. The explanatory variables evaluated were: age, gender, presence of chronic diseases, living alone, employment status, highest academic degree obtained, self-perceived health, perception of current episode severity, familiarity with their primary care center assigned by the health system, perception of the presence of equipment and supplies at their healthcare center necessary to treat the current episode, presence of suitable specialists at their healthcare center to treat the current episode, sense of having been abused ever at their primary care center, type of reference (by a professional or self-referral), perception of third-level healthcare costs compared to a first-level service costs, place being present when decided to go to emergency, having any acquaintance or close relative working at hospital Almenara and type of insured (policyholder or beneficiary).
   Although there is not a global agreement on what it is defined as IUES (Al-Mherat, Essalim, & Sahwehne, 2014), proper healthcare

was classified in this study as to when the patient can be categorized within priority levels 1, 2 and 3 from the Emergency Severity Index (ESI) (Agencia para la Investigación y calidad de la Atención Médica, 2012). The ESI is used to perform triage to patients at the moment of their arrival at the emergency, and classifies patients into five priorities according to the resource requirement to treat their disease.

Statistical analysis

Prior to undertake the inferential analysis, it was carried out the exploratory data analysis. Bivariate relations were analyzed between the (appropriate/inappropriate) use of emergency service and categorical explanatory variables. The analysis of all relations was conducted through the construction of contingency tables of 2x2 and the appearance probability of observed frequencies were randomly compared to the corresponding expected frequencies through the Chi-Square test of independence, considering a $\alpha < .05$ significance level for all the cases. Odds Ratios were also calculated and their confidence intervals to 95% for each resulted significant variable.

Variables that resulted significant to alpha level, indicated in the bivariate analysis, were included in the model of binary logistic regression. An additional analysis was performed taking into account two subgroups: younger than age 50 years and older than or equal to 50 years old. It was reported the pseudo coefficient of determination was reported, Nagelkerke´s R^2, and the result from the Hosmer-Lemeshow test to determine the model goodness of fit.

The analysis was carried out by using the statistical program R 3.0.3 on its RStudio platform.

Ethical aspects

Surveyed patients were given information about the data processing such obtained data would be put through, and the objectives of this study before signing up for the survey. Their consent to be surveyed was registered with an informed consent signature. Neither names nor any other data that could directly reveal the identity of surveyed people was collected.

Results

A total of 560 people were surveyed, which requested medical care from the emergency service at Hospital Guillermo Almenara in Peru city. The average age (standard deviation) of participants was 57.41 (19.3) years old, the 48.4% were male and the 51.6% were women.

Within the inappropriate use group, 50.5% CI 95% [46.3, 54.8] of patients were classified, according to the classification criteria established in this study. Whoever got classified as appropriate use was because they either needed a special urgent exam (20.4%), an emergency consultation with the on-call specialist (33.2%), or they needed to be hospitalized for more than 24 hours (49.5%).

The 20.7% of the surveyed people stated not being aware of the name nor the location of their primary care center assigned by EsSalud (Peru´s equivalent of a social security program). Regarding chronic diseases, 63.57% (356) of participants showed some sort of chronic disease. Blood hypertension was the most frequent disease with 16.4% (92 patients), followed by mellitus diabetes type 2 with 12.7% (71 patients). The 5.5% (31 patients) presented some type of cancer, while the 3.4% (19 patients) presented chronic kidney failure.

Table 1.
Variables associated with inappropriate use

Variable	Categories	Appropriate use (%)	Inappropriate use (%)	OR (CI 95%)	p-value (Chi-Square)
Gender	Male	148 (54.6)	123 (45.4)	1.49 [1.07, 2.08]	.018
	Female*	129 (44.6)	160 (55.4)		
Chronic diseases	Present*	198 (55.6)	158 (44.4)	0.5 [0.35, 0.72]	< .001
	Absent	79 (38.7)	125 (61.3)		
Equipment and materials	Do not exist*	43 (34.7)	81 (65.3)	2.50 [1.66, 3.94)	< .001
	Do exist*	186 (57.6)	137 (42.4)		
Specialists	Do not exist*	37 (35.6)	67 (64.4)	2.25 [1.43, 3.55]	< .001
	Do exist	189 (55.4)	152 (44.6)		
Reference	By a professional	69 (59.5)	47 (40.5)	1.69 [1.12, 2.57]	.012
	Self-referral*	200 (46.4)	231 (53.6)		
Cost	Highest	117 (60.9)	75 (39.1)	2.02 [1.42, 2.89]	< .001
	Equal or less*	157 (43.5)	204 (56.5)		
Place of origin	Workplace*	26 (36.1)	46 (63.9)	1.87 [1.12, 3.13]	.015
	Other place	251 (51.4)	237 (48.6)		

(*) Categories marked with an asterisk correspond to OR.

As it is observed on Table 1, the variables significantly associated with IUES were: gender, presence of chronic disease, existence of equipment and materials at the primary care center, specialists at the primary care center, type of reference, perception of cost and place of origin. The relationships and p-value associated with each one were presented on Table 1.

An analysis of binary logistic regression was carried out in order to evaluate the multivariate behavior of significant variables. The method was forward: Wald. Two models were created; on the first model, 560 surveyed individuals were considered; on the second, whoever was not aware of their primary care center assigned by the social security health system was excluded. This consideration was taken because people that were not familiar with their primary care center did not answer the questions regarding the lack of equipment, materials and specialists at their primary care center.

Table 2 was created taking into consideration the 560 participants, while Table 3, excluding everyone that was not aware of their primary care center. Both models selected the same variables as significant and Odds Ratio values do not present much of a difference.

Table 2.

Binary logistic model with 560 observations.

Variable	Coefficient	p-value	Odds ratio	CI 95%
Constant	-1.15			
Lack of equipment and materials	.794	< .001	2.212	[1.42, 3.44]
Self-referral	.532	.032	1.703	[1.05 – 2.77]
Equal cost or less	.713	.001	2.040	[1-35 – 3.09]

Hosmer-Lemeshow: Chi^2 = 4.321; DF = 8; p = 0.836; Nagelkerke R^2 = .23

Table 3.

Binary logistic model with 444 observations.

Variable	Beta	p-value	Odds ratio	CI 95%
Constant	-1.128			
Lack of equipment and materials	.779	.001	2.179	[1.40 - 3.39]
Self-referral	.541	.029	1.717	[1.06 – 2.79]
Equal cost or less	.695	.001	2.004	[1-32 – 3.04]

Hosmer-Lemeshow: Chi^2 = 4.154; DF = 8; p = .843; Nagelkerke R^2 = .22

In patients younger than 50 years old, absence of chronic diseases is associated to a higher inappropriate use (OR = 2.88 CI 95% [1.59, 5.18]), whereas in those older than or equal to 50 years old, the perception of absence of materials and equipment (OR = 3.14 [1.78, 5.52]), and the self-referral to a tertiary level (OR = 2.17 [1.19, 3.98]), are associated to the inappropriate use.

Discussion

Behind the large demand of emergency services and their inappropriate use, there is the reality of every patient that together determine certain social and economic factors, driving patients to seek a fast and efficient solution to their diseases.

According to Andersen and Newman (2008), the use health services could be explained by three determinants: social, individual, and by those from the heath service system. Social determinants include available technology and accepted social norms. Determinants from the health system include, in turn, available resources and their

organization, while individual determinants correspond to predisposing factors, enabling factors and need factors (level of disease). Predisposing factors of the services use are demographic characteristics such as age, gender, education, race, family size and work activity. Enabling activities include some individual characteristics (level of admission, type of insurance) and population characteristics (service availability and accessibility). Within the Peruvian social security, affiliated patients have unlimited coverage accessibility, reason why accessibility issues would be seasonal, administrative and cultural (Organización Internacional del trabajo, 2015).

This study revealed that approximately half of the patients that go in search for health services by the emergency in a tertiary referral hospital misuse these services, a similar percentage reported in the United States of America (Centers for Disease Control and Prevention [CDC], 2011; Gindi, Cohen, & Kirzinger, 2012), but above Europe (Lega & Mengoni, 2008). Other studies have reported high and low prevalence to the found in this study (Carret, Fassa, & Kawachi, 2007; Millá Santos, 2001). It´s also worth emphasizing that the prevalence of the IUES in the evaluated hospital could go higher because it was not possible to get to those patients that receive some quick assistance by the physician in triage and are not admitted to emergency care.

The female gender is associated with a higher IUES, and it becomes even more relevant when it is analyzed in women older than 50 years old. There seems to be no reasonable explanation to such phenomenon. However, it could be assumed that, within the group of women older than 50 years old, they have a wrong perception of their health (in a previous analysis of the variable gender and self-perceived health status, a significant association between the female gender and the perception of bad health was discovered within the same group older than 50 years old).

The presence of any chronic disease urges the patient to use the emergency more appropriately, particularly if they are younger than 50 years old. On the contrary, the absence of chronic diseases would increase the inappropriate use. Such phenomenon could be explained by a more frequent contact with health services and a broader knowledge about any chronic disease, information that people obtain when doing research on health in general. Similar results were found in a study carried out in the United States and Brazil (Carret et al., 2007; Grumbach, Keane, & Bindman, 1993). Also, in the study by O´Brien, the existence of association between chronic diseases and a more appropriate use was revealed (O´Brien et al., 1997).

Besides the absence of specialists in primary care to treat the current episode, the perception of absence of equipment and materials is also associated with an IUES. This is more evident in people over 50 years of age, who apparently would consider equipment and presence of specialists more important, assuming that their health status is more complex than a young person´s health. According to

Andersen and Newman (2008), it has to do with a component of the predisposing factor classified as a "belief", which would be an individual determinant in the use of health services. User´s perception that healthcare costs in a tertiary level are less or equal to the primary care is associated with a higher IUES. O´Brien in the United States reported similar results regarding cost perception and inappropriate use (O´Brien et al., 1997).

The place where the patient was at the moment of making the decision is also associated with the inappropriate use. For instance, deciding to go to the emergency to be treated while being at work is associated with the IUES. That decision may be influenced by the feeling of frustration of not being able to perform productively at work, which does not seem to be so when the person is at home (Andersen & Newman, 2008).

The multivariate analysis revealed that in general, variables that in conjunction explain the IUES are; perception of absence of equipment in primary care, self-referral and perception that tertiary level healthcare services cost equal or less than the provided in primary care.

In people over 50 years of age, variables acting within a multivariate context that are more associated with the IUES are; perception of absence of equipment in primary care and self-referral. The main variable associated with the inappropriate use in the group under 50 years old is the absence of any chronic disease. The female gender, the absence of chronic disease, the perception of absence of equipment in primary care, the perception of absence of specialists in primary care, self-referral, the perception that tertiary level healthcare services cost equal or less, being at work when deciding to go to the emergency, the perception of low cost healthcare in tertiary level services, are also associated with the inappropriate use of emergency services.

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Conflict of interest statement

I state that there was not any conflict of interest.

References

Agencia para la Investigación y Calidad de la Atención Médica. (2012). *Índice de gravedad de emergencia (ESI): Una herramienta de clasificación para los departamentos de emergencia.* Retrieved from http://www.ahrq.gov/professionals/systems/hospital/esi/index.html

Al-Mherat, A., Essalim, A., & Sahwehne, B. (2014). Visitas no urgentes entre pacientes atendidos en el Departamento de Emergencias del Centro Médico King Hussein. *Journalof the Royal Naval Medical Service,21*(1), 38–44.

Andersen, R., & Newman, J. (2008). Determinantes sociales e individuales de la utilización de la atención médica en los Estados Unidos: Determinantes sociales e individuales de la utilización de la atención médica. *El Milbank trimestral, 83*(4).doi: 10.1111/j.1468-0009.2005.00428.x

Carret, M. L., Fassa, A. G., & Kawachi, I. (2007). La demanda de servicios de salud de emergencia: factores asociados con el uso inapropiado. *BMC Health Services Research, 7*(1), 131. doi:10.1186/1472-6963-7-131

Centers for Disease Control and Prevention (2011). Encuesta Nacional de Atención Médica Ambulatoria del Hospital: *Tablas resumen del departamento de emergencias.* Retrieved from http://www.cdc.gov/nchs/ data/ahcd/nhamcs_emergency/2011_ed_web_tables.pdf

Gindi R.M., Cohen R.A., & Kirzinger W.K. (2012). Sala de Emergencia uso entre adultos de 18 - 64 : Salida temprana de estimaciones A partir de la Encuesta Nacional de Salud, de enero de - de junio de 2011 . División de estadísticas de entrevistas de salud, Centro Nacional de Estadísticas de Salud , 2012 . Retrieved from: http//www.bls.gov/ news.release/ecopro.t06.htm

Grumbach, K., Keane, D., & Bindman, A. (1993). Atención primaria y hacinamiento en el departamento de emergencias públicas. *American Journal of Public Health, 83*(3), 372–378.

Hansagi, H., Olsson, M., Sjöberg, S., Tomson, Y., & Göransson, S. (2001). El uso frecuente del departamento de emergencias del hospital es indicativo de un alto uso de otros servicios de atención médica. *Annals of Emergency Medicine, 37*(6), 561–567. doi:org/10.1067/mem.2001.111762

Lega, F., & Mengoni, A. (2008). ¿Por qué los pacientes no urgentes eligen servicios de emergencia en lugar de atención primaria? Evidencia empírica e implicaciones gerenciales. *Health Policy (Amsterdam, Netherlands), 88*(2–3), 326–338. doi:10.1016/j.healthpol.2008.04.005

Mamani, A., Obando, R., Uribe, A. M., & Vivanco, M. (2007). Factores que desencadenan el estrés y sus consecuencias en el desempeño laboral en emergencia. *Revista Peruana de Obstetricia Enfermeria, 3*(1), 50–57.

Millá Santos, J. (2001). Urgencias médicas: algo más que una serie televisiva. *Medicina Clínica, 117*(8), 295–296.

O'Brien, G. M., Stein, M. D., Zierler, S., Shapiro, M., O'Sullivan, P., & Woolard, R. (1997). Uso del ED como una fuente regular de atención: factores asociados más allá de la falta de seguro de salud. *Journnals of Emergency Medicine, 30*(3), 286–291.

Oktay, C., Cete, Y., Eray, O., Pekdemir, M., & Gunerli, A. (2003). Adecuación de las visitas al departamento de emergencias en un hospital universitario de Turquía. *Croatian Medical Journal, 44*(5), 585–591.

Organización Internacional del Trabajo. (2015). Estudio financiero actuarial de EsSalud 2015. Lima: Industrias Herbio S.A.C

Peduzzi, P., Concato, J., Kemper, E., Holford, T.R., & Feinstein, A, R. (1996). A simulation study of the number of events per variable in logistic regression analysis. *Journal of clinical epidemiology, 49*(12), 1373 - 1379.

Sánchez-López, J., & Bueno-Cavanillas, A. (2005). Factores asociados al uso inadecuado de un servicio de urgencias hospitalario. *Emergencias, 17*, 138-144.

Ugarte, C. (2000). Historia de los servicios de emergencia de Lima y Callao. *Revista Médica Herediana,11*(3), 97-106.

Uscher-Pines, L., Pines, J., Kellermann, A., Gillen, E., & Mehrotra, A. (2013). Visitas a urgencias por afecciones no urgentes: revisión sistemática de la literatura. □ e*American Journal of Managed Care, 19*(1), 47-59.