

LITHUANIAN EMERGENCY MEDICAL ASSISTANCE SYSTEM MANAGEMENT IMPROVEMENT STRATEGY

Gintautas Virketis¹, Veronika Matutyte²

¹ *Gintautas Virketis. Dr. Klaipeda University. Address: Parko Str 8 97001. Kretinga. Lithuania. Tel. +370 685 70706. E-mail gntsvrks767@gmail.com*

² *Veronika Matutyte. Lithuanian University of Health Sciences. Address: Sukileliu Av. 65-18. 49333, Kaunas. Lithuania. Tel. +370 679 40644. E-mail vero.matutyte@gmail.com*

Received 27 05 2017; accepted 27 06 2017

The health care management has to be effective and appropriately respond to new challenges, however, the health reform continuing in Lithuania can not be characterised as consistent, comprehensive, and well coordinated some issues have been defined. The aim of the research is to provide the measures for the EMA system management improvement and its subsystems. The methods – a systemic analysis of the scientific literature, a pilot, quantitative descriptive research; data statistical analysis methods. Results – authors suggest: the theoretical EMA system management and activity improvement process models; potential management improvement opportunities in individual parts of the emergency medical assistance system.

Key words: emergency medical quality, health care, management, availability of help.

JEL Codes: I19, R49.

1. Introduction

As stated in the World Health Organization (WHO) Forum, the reduction in mortality rates is the greatest challenge for public health organizations. The achievement of the goal requires new strategies and appropriate management of preventive systems, as well as human and financial resources (Global ..., 2009). However, the constantly changing external and internal environment of the health care system results in new unfavorable trends it is needed to develop universally accessible and acceptable quality health care. The health reform continuing in Lithuania can not be characterized as consistent, comprehensive, and well coordinated.

As a result, some negative aspects (because of misunderstanding of EMA concept by interested parties there are conflicts between doctors and patients; due to the restructuration of hospitals some of them can essentially worsen the service quality; the lack of the common goal pursuit by responsible institutions) of the EMA system management in Lithuania were identified.

For the EMA system management to ensure quality, effective, advanced, and timely provision of EMA services, each country ought to ensure constant improvement of the EMA system management, based on recent knowledge, scientific achievements, and practical experience of other countries (Tintinalli, 2010). Scientific publications of advanced foreign countries emphasise the aspects of management: changes in the EMA system management (Alper, 2002); management of human and medical resources in order to provide assistance in the event of emergency (Fleishmann, 2007); and continuous quality improvement and measurement of activities and their outcomes with the aim of accountability (Kaluzny, 2006). As indicated in the Lithuania's Health System Development Dimensions 2011–2020 prepared by the Republic of Lithuania Ministry of Health, no universal and the most effective health system organisation model has been developed, and each state, given its historical and cultural traditions, economic situation, and other factors, has to choose its own way (VŽ, No. 73-3498, 2011).

The authors believe that, in order to more effectively manage the EMA system, it is necessary to integrate the knowledge of different areas of science, to focus it on the needs of the general public, a rational use of limited material resources, the demand for the personnel, and the fields of further scientific research, and to anticipate the priorities of further EMA system development.

The problem question is how to increase the effectiveness of the emergency medical assistance system by improving the management of the emergency medical assistance system?

The aim of the research. Through the development of a theoretical model of the management of the emergency medical assistance system and through the elaboration and application of the developed quantitative research methodology, to provide the measures for the EMA system management improvement and its subsystems.

Research subject – management of the emergency medical assistance system. Research object: the emergency medical assistance system.

Research objectives. 1. Upon defining the concepts of emergency medical assistance, to reveal the specificity of its management. 2. Upon analysing the EMA system management models in foreign countries and revealing the problematic areas of the system management, to develop a theoretical EMA system management model. 3. Given the developed EMA system management theoretical model, to develop a research methodology that ensures the process of the EMA system management improvement. 4. Upon examination of the secondary statistical data and legal regulation of the Lithuanian EMA, to identify the weaknesses in the EMA system management. 5. Upon carrying out empirical research, to propose measures for the EMA system management improvement. 6. After the proposal of the measures for the EMA system management improvement, to identify the subsystems of the EMA system management.

Research method. The sample population consisting of 168 individuals, at the confidence interval of 5% and the confidence level of 95%, the calculated number of the respondents was 117. The respondent survey was carried out online in the period of 13 February 2015 to 20 April 2015 (at: Apklausa.lt). The questionnaires were properly filled in by 118 respondents (including 35 heads of intensive care units, 31 heads of emergency departments, 33 heads of hospitals, and 19 heads of ambulance services). For the analysis of the results, SPSS 21.0 was used. In the statistical analysis, the relationships between the nominal characteristics were assessed by the chi-square (χ^2) criterion, and between the interval variables, by the statistical method of the comparison of means. For the assessment of statistically significant differences, $p < 0,05$, and for very significant, $p < 0,01$ was chosen.

2. Results

Even though the concept of EMA has been frequently used in the areas of medicine and law, it does not have a clear definition in the science of management. However, both from the scientific and practical viewpoints, the EMA concept is best expressed by the English term *emergency care*, covering the following factors: the unexpectedness of an event; a poor (life threatening) state of health; the urgency of aid (to be provided immediately, without delay); proficiency of aid (the need for skilled care and inpatient services). Given the abovenamed factors, the author proposed the following EMA concept definition: *Emergency medical assistance is a qualified medical assistance provided due to an unexpected, severe medical condition within the shortest reasonable time.*

Based on the EMA systems management theory, different EMA system models (English-American and French-German) have been compared. Both models observe the same principle: by means of contemporary technologies and doctor's services, to provide patient with EMA services and simultaneously seek to ensure the compliance of the services with the highest possible quality standards (Anthony, 2011). The essential differences between the German and American EMA system management models are the assistance providing place and staff, patients transportation to the hospital and the period of assistance provide (Table).

On summarising the views of scientists (Kaluzny, 2006; Hodkinson, 2010), none of the individual health care management models is able to provide all the opportunities, however, different models offer various useful insights into the objectives, contexts, and management functions. According to C. Donaldson (1996), health care needs can only be met through the use of health care services which are the result of the system operation. The system consists of constantly communicating and interrelated organisations and groups which make up the forming whole.

Authors present a theoretical EMA system management model developed by G. Virketis (2017) and consisting of the following elements: the admission and the discharge; structural components; internal relations between the components; integration with the health system; levels of service provision; objectives (functions) and processes for the objective achievement; feedback for the management improvement assurance;

the boundaries of the system, separating the system- and non-system elements; and the external environment and relations through which integration with other systems takes place. The EMA provision is activated by an event: an accident or acute exacerbation of a chronic disease.

Table. Differences between German and American EMA system management models

German EMA system	American EMA system
The EMA provision is ensured through providing assistance at the accident site or in patient's home ("hospital at the patient's")	EMA is less frequently provided at the accident site
Fewer patients are transported to hospitals	More patients are transported directly to hospitals
EMA providers are professional doctors assisted by other medical staff	Providers there are paramedics along with other EMA personnel
Doctor provide assistance at the accident site and during transportation	EMA doctors provide assistance at the accident site or during transportation merely in exceptional cases
Patients are taken to a specialised hospital department and bypasses the ED	More patients are transported directly to hospitals
The period of the pre-hospital assistance provision is quite long	The period of pre-hospital assistance provision is shorter than in Germany
The EMA system is part of the public health organisation	The EMA system in the USA is part of the public security organisation

Authors summarise the concepts of the EMA system and the EMA system management and proposes the following definitions: *emergency medical assistance is the staff of emergency medical assistance, infrastructure, finances, and other elements of the system and their interrelationships that ensure effective, accessible, and high quality local, regional, or national emergency medical services; emergency medical assistance management is the assurance of the system activity, functioning through the related management bodies, processes, and means in pursuit of the objectives of accessibility and quality set for the EMA system.*

The EMA assistance provided in Lithuania is more in line with the English-American EMA model, the essential difference between the Lithuanian and American models to be named is the existence of teams consisting merely of doctors, however, there are no individual Emergency Departments (ED) that do not belong to hospitals.

For the principal measure of the EMA patient flows regulation, i.e. a five-level triage system, the following titles were essentially covered all the states and the period of time within which, in the respondents' opinion, the patients should start getting EMA is indicated: critical (immediately, within 10 min), very urgent (10–30 min), urgent (from 30 min to 1 h), non-urgent (from 1 h to 2 h 30 min), and ambulatory (from 2 h 30 min to 4 h). The majority (68.1%) of the survey respondents approved, or totally approved, of the statement that the time period within which EMA ought to start to be provided, should be divided into 5 levels. The research proved that, should nurses be doing the primary patients' condition evaluation, the doctor's time for the principal tasks would become longer.

Based on the survey outcomes, which also confirmed the proposed measures appropriate for the EMA management, the subsystems of the EMA system management were identified and combined into a model of emergency medical assistance system management (Fig.).

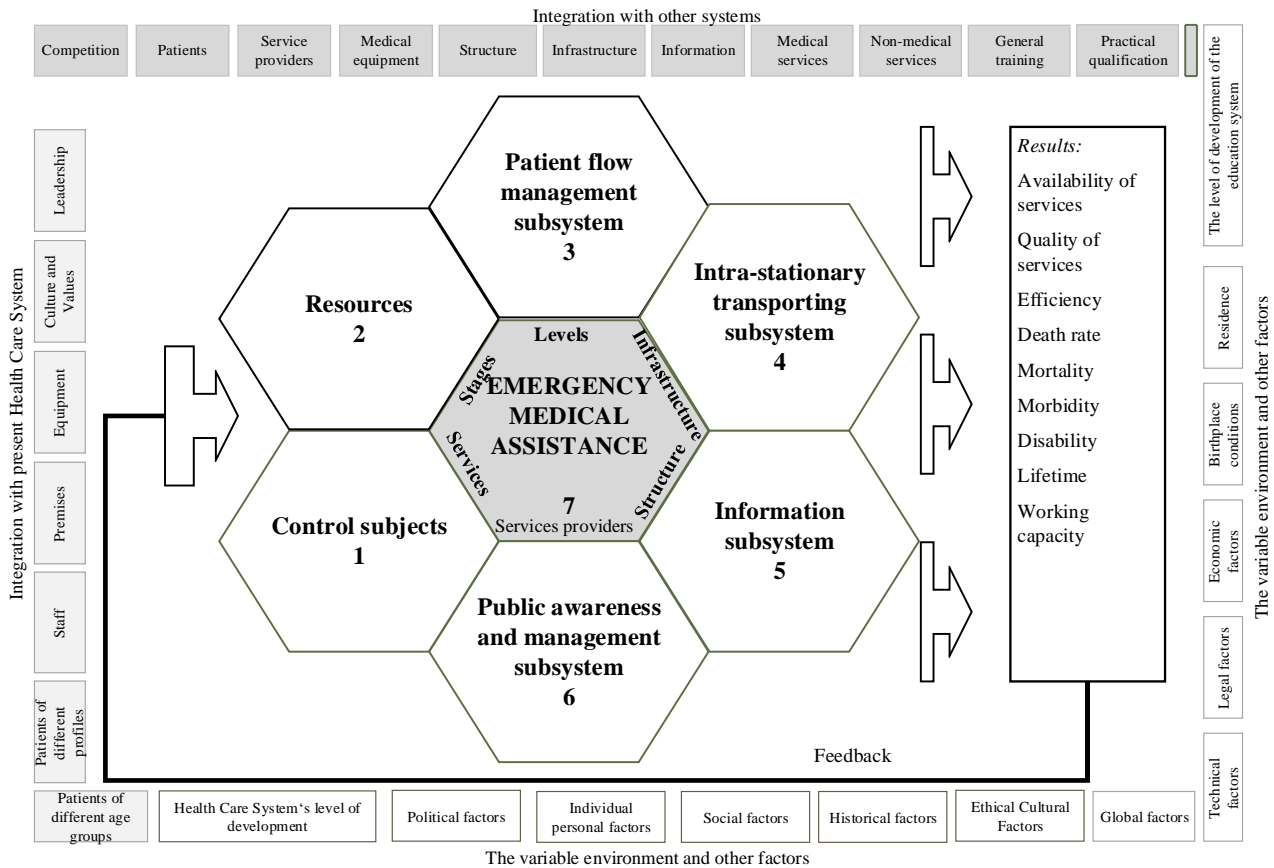


Figure. A model of the emergency medical assistance system management

The process of EMA services provision, presented in the mixed model EMA provision, covers individual moments: coordination, team, EMA at the accident site, prehospital transportation, condition evaluation and EMA provision in the ED, and interhospital transportation. Authors propose a direct EMA call number 03. Most of the patients, after being provided with minimal assistance or during the process of assistance provision, are transported to the hospital ED. After the AS team assesses patient condition by the same 5 EMA levels that are applied to evaluate patient condition on arrival at hospital, there will be no need to transport part of the patients to hospitals of an appropriate level or profile or the centres of functional clusters. Whenever necessary, patient is transported to the ED to get EMA, a common with the ED protocol is filled in, and the patient is transferred to the ED staff. In the ED the protocol started by the AS team is filled in. The medical condition is evaluated by a specialised nurse, diagnostic and treatment services are provided by doctors and military medical personnel in a certain time limit. Depending on the severity of patient's condition and the need for assistance, the condition evaluation can result in several options: patients of EMA levels: 1–2 patients are directed to intensive care units to receive assistance; 3–4 – are

sent to hospitals to be treated or monitored; 4–5 – are discharged home for outpatient treatment and planned consultations with relevant specialists. Part of the patients, depending on the severity of their condition, may not receive the necessary services in hospitals they were brought to – in such cases, they are sent to another medical institution. The patient transportation model demonstrates the relationship of the transportation type (primary, secondary, or tertiary) with hospitals of different service provision levels (district, regional, national, or university) and the service provision stages (pre-hospital, hospital, interhospital, and posthospital).

Upon evaluation of the need for collection, accumulation, and analysis of the proposed and the commonly provided information, the linking chain for all the subsystems is the information subsystem (information relations). The information received by the information system, properly processed and organised, is presented to its principal users: patients, politicians, management subjects, public health specialists, the staff of the education system, and other interested physical and legal persons (journalists, participants of health promotion programmes, etc).

Practical significance of the research: 1. The elaborated and made uniform EMA system management concepts can be useful for the improvement of the regulatory environment of the Lithuanian EMA system and its management. 2. The accumulated research materials on the EMA system management can be used in the study process and can be useful for prospective scientific research. 3. The developed EMA system management model provides for favourable conditions to essentially improve the EMA services accessibility and quality in specific hospitals providing services to specific patients. 4. The conducted research contributes to the Republic of Lithuania Ministry of Health policy making aiming to improve the effectiveness of both the EMA system and the whole health care system activities and to ensure effective accessibility of health care services and cooperation with public health professionals, as well as with community-based and nongovernmental organisations.

3. Conclusions

1. The development of the concepts of the emergency medical assistance system management, as well as emergency medical assistance, are related to human health and a life threatening and rapidly changing environment. Authors define the concepts in the following way: the EMA system implies the staff of emergency medical assistance, the infrastructure, the funds, and other elements of the system and the relations between them that ensure effective, accessible, and high quality local, regional, or national emergency medical assistance services; the EMA system management implies the assurance of the system functioning through the related management bodies, processes, and measures in pursuit of the goals of accessibility and high quality set for the EMA system. Authors argue that the specificity of the EMA system management – the complexity of the research object, interdisciplinarity, and the abundance of causal variables – is best explained by the provisions of the systems theory.

2. The authors have developed a theoretical EMA system management model and identified the elements characteristic of the system: the management subjects and

resources, structural components and their interrelations; integration with the current health system and other systems; the objectives (functions) and transformational processes to achieve the aims; the boundaries of the system, the interaction with the changing external environment and other factors; and the outcomes and the feedback.

3. The improvement of the emergency medical assistance system management is to be carried out in three stages: identification of the current EMA system management situation and problematic areas; identification of the measures for the EMA system management improvement; evaluation of specialists' views on the purposefulness of the proposed measures intended to improve the EMA system management.

4. The survey identified the following weaknesses in the emergency medical assistance system management in Lithuania: insufficient EMA services legal regulation; inadequate EMA evaluation levels, resulting in too large patient flows; a shortage of developed and approved EMA performance standards, algorithms, or protocols; a shortage of staff and their inadequate qualification and competences; a lack of quantitative and qualitative performance measurement indicators for EMA services, the EMA system performance evaluation does not exist; the absence of regulation of patient interhospital transportation; a lack of funding for EMA services; the public's information and education are not ensured.

5. The outcomes of the conducted research disclosed potential management improvement opportunities in individual parts of the EMA system to improve the EMA system efficiency and to ensure the accessibility and quality of its services: uniform application of systematised concepts; triage optimisation; identification of the quantitative and qualitative indicators of emergency medical assistance; greater empowerment for nurses, the use of the military medical personnel in medical institutions providing EMA services; regulation of external and internal patient flows; development of a long-term emergency medical assistance operational programme and activity coordination; regulation of payment for EMA and non-EMA services; appropriate public's information and education.

6. The subsystems of the EMA system management were established, including the subsystem of emergency medical assistance, patient flows management, patient interhospital transportation, information and of public's education and information.

References

Alper, M. (2002). Managing in the „new“ era of managed care // *Managed Care Quarterly*. No. 10: 24–29.

Anthony, D. R. (2011). Promoting emergency medical care systems in the developing world: weighing the costs // *Glob Public Health*. No. 6(8): 906–913. – <https://doi.org/10.1080/17441692.2010.535008>.

Donaldson C. (1996). Purchasing to Meet Need. Reforming Health Care Systems. – British Association for the Advancement of Science.

Fleischmann, T., Fulde, G. (2007). Emergency medicine in modern Europe // *Emergency medicine Australas*. No. 19(4): 300–302. – <https://doi.org/10.1111/j.1742-6723.2007.00991.x>.

Global forum on trauma care. (2009). World Health Organization (WHO). – http://www.who.int/violence_injury_prevention/services/traumacare/global_forum_meeting_report.pdf [10 05 2017].

Hodkinson, P. W., Walis, L. A. (2010). Emergency medicine in the developing world: a Delhi study // *Acad Emerg Med*. No. 17(7): 765–774. – <https://doi.org/10.1111/j.1553-2712.2010.00791.x>.

Kaluzny, A. D. Shortell, S. M. (2006). Organization theory and health services management. *Health Care Management: Organization Design and Behavior*. – New York: Thomson Delmar Learning. 8 p.

Lietuvos Respublikos Seimo nutarimas dėl Lietuvos sveikatos sistemos 2011–2020 metų plėtros metmenų patvirtinimo, Nr. XI-1430, Vilnius 2011. – <https://www.e-tar.lt/portal/en/legalAct/TAR.0E672DF64E70> [2017 04 30].

Tintinalli, J. E., Cameron, P., Holliman, C. J. (2010). EMS: A Practical Global Guidebook. – PMPH-USA.

Virketis, G. (2017). Skubios medicinos pagalbos sistemos valdymo tobulinimas. Daktaro disertacija. Klaipėdos universitetas. 246 p.

LIETUVOS SKUBIOS MEDICINOS PAGALBOS SISTEMOS VALDYMO TOBULINIMO STRATEGIJA

Gintautas Virketis¹, Veronika Matutytė²

¹ Dr. Klaipėdos universitetas, ² Mgr. Lietuvos sveikatos mokslų universitetas

Įteikta 2017 05 27; priimta 2017 06 27

Santrauka

SMP sistemos valdymo tobulinimas turi vykti nuolat, kad sistemos valdymas galėtų užtikrinti kokybišką, veiksmingą, šiuolaikišką ir laiku SMP paslaugų teikimą. SMP sistemos valdymas yra platus, apimantis skirtingas tarpdisciplinines sritis, Lietuvos mokslininkų darbuose menkai tyrinėtas, todėl jo nagrinėjimas aktualus moksliniu ir praktiniu požiūriais. Darbo tikslas – pateikti SMP sistemos valdymo tobulinimo priemones ir posistemės. Darbo metodika – žvalgybinis, kiekybinis aprašomasis tyrimas, taikyti duomenų statistinės analizės metodai, modeliavimas. Rezultatai. Sudarytas teorinis SMP sistemos valdymo bei veiklos tobulinimo proceso eigos modelis; pasiūlytos SMP sistemos valdymo tobulinimo priemonės bei sudarytos SMP sistemos valdymo posistemės.

Raktiniai žodžiai: skubioji medicinos pagalba, kokybė, sveikatos priežiūra, valdymas, pagalbos prieinamumas.

JEL kodai: I19, R49.