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Letter to the Editor

Emergency First Aid Allocation Model in Prehospital Triage in Two-Level Supply Chain Network

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Dear Editor-in-Chief

One of the most important challenges of the present era at the national and international levels is the need for a disaster management system in the face of natural and unnatural disasters (1). Providing and allocating resources for health services needed by victims in times of disaster has always been a challenging issue and plays an important role in reducing human and financial losses (2). One of the practical concepts in this field with the aim of "maximum service to the most people" is the use of the word triage. Triage means prioritizing the provision of care to patients in need, which is defined by the lack of resources needed to provide simultaneous service to patients (3).

On the other hand, in addition to proper triage, humanitarian supply chain management in disasters is also of particular importance. Supply chain management seeks to reduce supply chain costs, including the cost of moving goods from manufacturers to distribution centers (hospitals and health care providers) and to increase the level of service to patients in emergencies and emergencies during relief. Therefore, to achieve this goal, determining the number of centers and the optimal location of emergency service distribution centers is a critical strategic issue in the supply chain (4). So the aim of this study is presenting emergency first aid allocation model in prehospital triage in two-level supply chain network.

The applied model for determining the efficient distribution centers of supply chain and allocation of goods to health centers, especially hospitals in times of crisis and providing pre-hospital triage services is presented. Examining the different models, it is observed that most of the previous models only locate the facilities based on the principle of dispersion and the concept of efficiency is not considered in those models. For this reason, in this model, to solve this problem, a combination of scattering model and simultaneous aggregation of data envelopment analysis has been used to examine the efficiency of all candidate points to provide triage services to patients and the injured simultaneously (5).

In other words, the purpose of this model is to select the maximum number of facilities that should be located in crisis management. The location is also one of the candidates to provide triage services to the injured and to determine the amount of goods or medical services allocated to patients in times of crisis, so that the coverage of

injured patients and injured by emergencies by These centers, according to the principle of dispersion, lead to increased efficiency and reduced costs (6).

In this model, in order to calculate the efficiency of potential locations to provide triage services, for each decision-making unit according to the definition of the problem, certain inputs and outputs must be considered. Adverse factors such as the cost of deploying a crisis team, as input, and favorable factors such as profitability, access to emergency services, reliability of service and flexibility in patient care, which aims to increase the most services in the shortest time and lowest cost. Are considered as output (7).

Finally, this study is the first to present a model that solves the model by variable change method and integration of objective functions. The results showed that in this model, unlike most similar studies, the cost of establishment and profit from the provision of services are not considered as objective functions, but these cases due to preventing the increase of objective functions and proper calculation of efficiency of different points, to The title of input and output criteria is a function of data envelopment analysis, which is considered as an innovative idea of this research.

Other results of this study also show that location study leads to the success of health care units and can reduce shipping costs. Quotation, providing fair services to patients, and other purposes to be used in this regard. On the other hand, in this model, only the cost function is considered as production costs (including the cost of manpower, commissioning and supply of medical raw materials) and transportation of drugs or even injured patients to health care providers. Also, in the case of distribution centers that carry out the activity of storing drugs and distributing health goods or medical equipment, maintenance and ordering costs are considered as cost items.

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Conflict of interest

The authors declare that there is no conflict of interests.

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