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### Presentation of Humanitarian Logistics Development Model by Athletes

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Article Info	Abstract
<p><b>Article type:</b> Research Article</p> <p><b>Received:</b> 11 Feb 2023</p> <p><b>Accepted:</b> 06 Apr 2023</p> <p><b>Published online:</b> 10 Dec 2023</p>	<p>Humanitarian logistics refers to the provision of assistance during disasters by volunteer human forces. The expansion of the popularity of athletes in the national arenas and the trust of the people of the society in the athletes has caused them to have a potential in the way of charity work and also in the direction of implementing humanitarian logistics. The current research was designed and implemented with the aim of providing a humanitarian logistics development model by athletes. This research is descriptive-analytical in terms of its applied purpose. The statistical population of this research was made up of all the champion athletes of Iran, and 384 people were considered as a statistical sample using the available sampling method, based on the Krejcie and Morgan table. The data collection tool in this research is a researcher-made questionnaire. Statistical analysis was done using SPSS and Amos software. The results of exploratory factor analysis show that 5 factors: managerial, cultural, human, legal, and facilities-technological are effective in the development of humanitarian logistics by athletes, and these 5 factors can explain 68.044% of the variability (variance) of the variables. Also, based on the findings of the research, the role of management factors with a total effect of 0.781 has the most impact on the development of humanitarian logistics by athletes.</p>
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## Introduction

Every year, natural disasters and unforeseen events plague different parts of the world. Due to their special nature, disasters have many destructive effects on the lives of the residents of different regions ([Yadav & Barve, 2015](#)). When a large-scale disaster occurs, emergency rescue and ensuring the effectiveness of rescue and reducing the waste of emergency resources are essential ([Wang & Sun, 2023](#)). Regardless of the main reasons for the increase in the occurrence of these events, one clear conclusion is that more capacity is needed to provide relief to the victims and rebuild the disaster sites ([Kehler, 2004](#)).

The word logistics includes planning, preparation, design, provision, transportation, inventory, storage, distribution and satisfaction of the recipient; In short, all logistics operations must be designed in order to send the right goods, distribute them to the right people and at the right time ([Van Wassenhove, 2006](#)).

Logistics management system is a system that includes a single methodological and information base that combines related functional units ([Tursunaliyevich, 2020](#)). An effective logistics requires identifying the influencing factors, determining their importance and finally operationalizing these factors by the organizations in charge of relief and rescue ([Barani Beyranvand et al., 2017](#)).

With these explanations, the necessity of a comprehensive system for logistics management seems important when dealing with the crisis and minimizing the losses and costs caused by it. One of the important ways to reduce injuries caused by natural and unnatural events is the formation and creation of humanitarian logistics ([Schulz & Heigh, 2009](#)).

Humanitarian logistics in academic literature refers to the process of planning, implementation and effective control of the flow of costs and information and storage of goods and needed materials from the point of origin to consumption, in such a way that its main goal is to reduce and relieve pain and suffering. People have seen the incident ([Ghasemi et al., 2018](#); [Kabra et al., 2015](#)). Therefore, it is necessary to design an efficient strategy to support humanitarian logistics in implementing appropriate facilities to provide relief resources during a disaster ([Yang et al., 2023](#)).

Also, humanitarian logistics refers to the formation of human resources at the time of incidents and voluntary efforts by human resources to reduce injuries; In other words, humanitarian logistics refers to the provision of assistance during incidents by volunteer human forces ([Ahmadi et al., 2014](#)).

People and actors in logistics and humanitarian relief operations are people with different cultures, goals, interests, skills, and powers, but the key players are governments, militaries, aid agencies, donors, NGOs, and the private sector ([Cozzolino & Cozzolino, 2012](#)). In a research by [Suarez-Moreno et al. \(2016\)](#), they showed the impact of processes, actors and their relationships on the performance of the humanitarian aid chain; According to [John et al. \(2019\)](#), one of the main challenges of the humanitarian supply chain is coordination between different actors.; Also, in a research, [Sadeghi Moghadam et al. \(2022\)](#) concluded that the coordination of humanitarian resources in the scenario of charity aid is higher than the scenario of government aid.

The humanitarian supply chain includes planning, managing activities related to materials, information, and financial affairs during disaster relief, which requires coordination and cooperation among the members involved in the supply chain ([Thomas & Kopczak, 2005](#)). Coordination between the actors of the humanitarian supply chain leads to increased efficiency and responsiveness to the affected people ([Vahanvati & Mulligan, 2017](#)). To deal with emergency and complex situations caused by natural disasters, the actors involved must have the necessary motivation to coordinate with each other in order to increase the efficiency of relief operations; The term "actors" refers to various stakeholders who are directly or indirectly involved in relief operations ([Forghani & pirastehfar, 2018](#)). Coordination in this field is such that the government and non-governmental organizations must quickly assess the current situation and start sending relief goods and human forces to the demand points within a limited time ([Ji & Zhu, 2012](#)).

The dimensions of sports have developed so much that global communities are always looking for a different performance from sports industry activists, and for this reason, the international community

demands expectations from this social subsystem beyond its internal appeal ([Waardenburg & Nagel, 2019](#)). On the other hand, the sports industry, like other industries around the world, pays attention to social responsibility, so that sports organizations, like their counterparts in other commercial companies, seek to perform reasonable and popular behaviors, and social responsibility is one of the strategic elements known in today's world. ([Armstrong et al., 2018](#)).

The Green Book of the European Commission defines social responsibility as a concept that companies and organizations can combine environmental and social concerns with their business activities and address these concerns through interaction ([Scarpato et al., 2020](#)). Sports organizations should also feel that society's problems are part of their problems and they should try to solve them and use part of their financial and human resources in this way. ([Salimi, 2020](#)). In this regard, the research of [Paramio-Salcines et al. \(2013\)](#), has mentioned voluntary work as part of the social responsibility of clubs, sports organizations and athletes.

This is despite the fact that the use of athletes and the importance of the role of athletes as influential forces in non-sports environments in order to improve the development of humanitarian logistics have been less investigated by researchers. In [Jafari et al.'s research \(2020\)](#), showed that knowledge, management, coordination, technological and legal obstacles are effective obstacles in the formation of reverse logistics in sports events, and among The identified obstacles, legal and administrative obstacles, due to their great importance, play a key role in the formation of other obstacles.

Due to their potential, athletes have an important role in the creation and development of humanitarian logistics, and the functions of athletes in the social issues of the society have caused them to have a strong potential for the formation of humanitarian logistics ([Haavisto & Kovács., 2019](#)). In other words, athletes as influential forces in society can facilitate the process of providing assistance to individuals and organizations by being in this chain. Athletes of a country are considered as its human capital; As a result, sports and athletes play a major role in society ([Khaledian et al., 2013](#)).

On the other hand, the lack of comprehensive research and, as a result, the lack of comprehensive planning for the benefit of athletes in the development of logistics of humanitarian aid, has caused targeted efforts in this field to not be formed when accidents and problems occur, and practically the existing potentials are not to be exploited in this area. Therefore, carrying out specialized research to find out the effective factors in the implementation of humanitarian logistics measures through athletes will lead to comprehensive and complete planning in the path of growth and expansion of this logistics.

Hence, the lack of research regarding humanitarian logistics measures through athletes is clearly felt. The emergence of these problems has caused the current research to be designed and implemented with the aim of providing a humanitarian logistics development model through athletes. Undoubtedly, the results of the current research can lead to the development and expansion of humanitarian logistics measures by athletes. The main questions of this research are as follows:

What are the components of developing humanitarian logistics development model through athletes?

What is the model resulting from these components?

## Research Methods

The current research is applied in terms of its purpose and descriptive-analytical in terms of methodology, and its data collection was done in both library and field studies. Library sources and articles were used to collect information in the field of theoretical foundations and literature, and a questionnaire was used to collect field information.

The statistical population of this research was made up of all Iranian champion athletes. In this research, the criterion was that the research samples have at least one championship award at the provincial, national or international level, and the fame of the athletes was not the criterion for selecting the samples, and the research samples included athletes with championship awards from all disciplines. The statistics of the desired community are unlimited; using the table of [Krejcie and Morgan \(1970\)](#), the number of 384 people was considered as a statistical sample. The research samples were selected using available sampling method and the questionnaire was emailed to them.

The collection tool in this research is a researcher-made questionnaire, which includes the personal

characteristics of age and education in the first part, and the humanitarian logistics component questionnaire in the second part. This questionnaire included 25 questions based on a 5-point Likert scale that includes 5 ranges (Very poor, Poor, Fair, Good, Excellent). Who assigned scores of 1, 2, 3, 4, 5 respectively from Very poor to Excellent? To prepare the questionnaire, the items related to humanitarian logistics were identified by the athletes through interviews with the professors of sports management, and the questionnaire was first prepared and then revised and finalized by the experts.

To measure the reliability of the questionnaire, Cronbach's alpha coefficient was used and it was 0.92 for the entire questionnaire, which indicates the high internal validity and correlation of the items. To measure the validity of the research questionnaire, the formal method, i.e. the approval of professors and experts in the fields of sports management, as well as KMO and Bartlett's sphericity tests were used. The amount of KMO in this research is 0.801 and the characteristic of Bartlett's sphericity test has justified the implementation of factor analysis, which indicates the adequacy of the sampling volume for factor analysis. Data analysis was done using spss software version 23 and Amos software version 23.

## Findings

In this part, first, with the factor analysis method, the set of 25 actions related to the development of humanitarian logistics of athletes were factorized. In fact, using exploratory factor analysis, was done the relationship between the identified measures and the necessary factorization. The output of this section can be used in structural equation modeling. In fact, during exploratory factor analysis (EFA), the variables are factored in a suitable way, and then this factorization is confirmed or rejected during confirmatory factor analysis in the structural equation modeling (SEM), technique.

The demographic information of the athletes participating in the research, including their age and education level, can be seen in Table 1.

**Table 1- The demographic information of the athletes participating in the research**

Row	Variable		Number	%
1	Age	20 and under	132	34.4
		between 20 and 30	178	46.3
		30 and over	74	19.3
2	Education	Diploma and less	53	13.8
		Associate	68	17.7
		Bachelor	93	24.2
		Master	107	27.9
		PhD	63	16.4
Total			384	100

## Exploratory Factor Analysis

According to the results of Table 2, it was found that after Varimax rotation, which is done to better determine the factor load, five factors have special value higher than one. According to the cumulative percentage column, it is clear that these 5 factors can explain 73.075% of the variability (variance) of the variables.

**Table 2- The results of explained variances**

Factor	Special value	% Of Variance	Cumulative %
1	7.150	21.556	21.556
2	5.089	18.098	39.654
3	2.159	14.180	53.834
4	1.197	11.230	65.064
5	1.101	8.011	73.075

It is not easy to identify the measures related to each factor in the non-rotation method, so we rotate the factors using the Varimax method to increase their interpretability. Table 3, shows the research factors and items along with their factor load with rotation.

**Table 3- The matrix of rotated factors of the set of 25 questions in the Marimax method**

Questions	Factor				
	1	2	3	4	5
Support of senior sports managers	0.51				
Existence of appropriate procedures in attracting athletes to humanitarian logistics	0.65				
Informing about how athletes enter and perform in humanitarian logistics	0.70				
Existence of short-term and long-term plans to attract athletes to humanitarian logistics.	0.76				
Establishing evaluation and monitoring of the effectiveness of athletes in times of crisis.	0.82				
Group decisions with athletes in times of crisis.	0.56				
Creating facilities for the presence and accommodation of athletes in times of crisis.	0.67				
Determining the fields and areas required for the activities of athletes during a crisis.		0.54			
Teaching athletes how to act in times of crisis		0.70			
Creating associations and legal organizations of athletes to improve their presence in times of crisis.		0.66			
Improving the technical knowledge of athletes regarding activities in times of crisis.		0.74			
Determining clear duties for athletes in times of crisis.			0.76		
Creating trainings for athletes regarding the importance and how to enter the logistics of humanitarian aid.			0.80		
Improving the motivation of athletes to participate in humanitarian logistics.			0.70		
Reflecting the positive behaviors and activities of athletes during a crisis through the national media.			0.84		
Increasing the scope of independence of athletes to attend and work during a crisis.				0.66	
Improving organizational communication with athletes.				0.69	
Creating a suitable organizational structure in times of crisis to cooperate and coordinate with athletes.				0.51	
Creating databases of athletes applying for activities in times of crisis.				0.59	
Creating appropriate information technologies for athletes in times of crisis.				0.56	
Involving athletes according to their abilities in times of crisis.				0.63	
Announcing the general and specific need for athletes in times of crisis through public media.				0.72	
Maintaining and improving the communication infrastructure in times of crisis to communicate with athletes.					0.60
Reducing legal obstacles for the presence of athletes in times of crisis					0.65
Creating a legal framework for the selection of athletes used in times of crisis.					0.67

Table 3, shows the items placed in each factor as follows:

The first factor includes 7 questions which are known as management factors.

The second factor includes 4 questions which are known as cultural factors.

The third factor consists of 4 questions known as human factors.

The fourth factor includes 7 questions which are known as legal factors.

The fifth factor includes 3 questions, which are known as the factors of facility-technological factor.

According to the results of the exploratory factor analysis, the conceptual model of the research was designed. Figure 1 shows the conceptual model of the research.

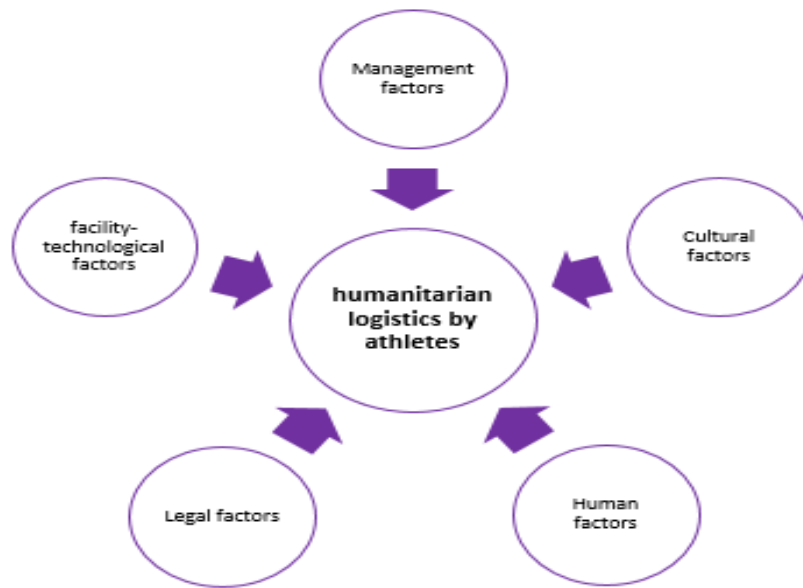


Figure 1. Research conceptual model

**Structural equation modeling**

In the next step, the path analysis test was used to determine the effect of each factor. Table 4, shows management factors with an overall effect of 0.781 have the greatest impact on the humanitarian logistics model through athletes, also cultural factors with 0.754, human factors with 0.702, legal factors with 0.663, facility-technological factors with 0.597, were effective.

Table 4- The effects of research variables

factor	direct impact
management factors	0.781
cultural factors	0.754
human factors	0.702
legal factors	0.663
facility-technological factors	0.597

As can be seen in table 5, the whole research model shows the goodness of the model according to the fit indices.

Table 5- Indicators related to model fit

Index	The amount obtained	Acceptable range	Result
CHI Square/DF	1.041	Smaller than 3	Accepted
RMSEA	0.041	Less than 0.05	Accepted
CFI	0.952	More than 0.9	Accepted
GFI	0.974	More than 0.9	Accepted
AGFI	0.936	More than 0.9	Accepted
NFI	0.923	More than 0.9	Accepted
NNFI	0.935	More than 0.9	Accepted

Figure 2 shows the final model of the current research.

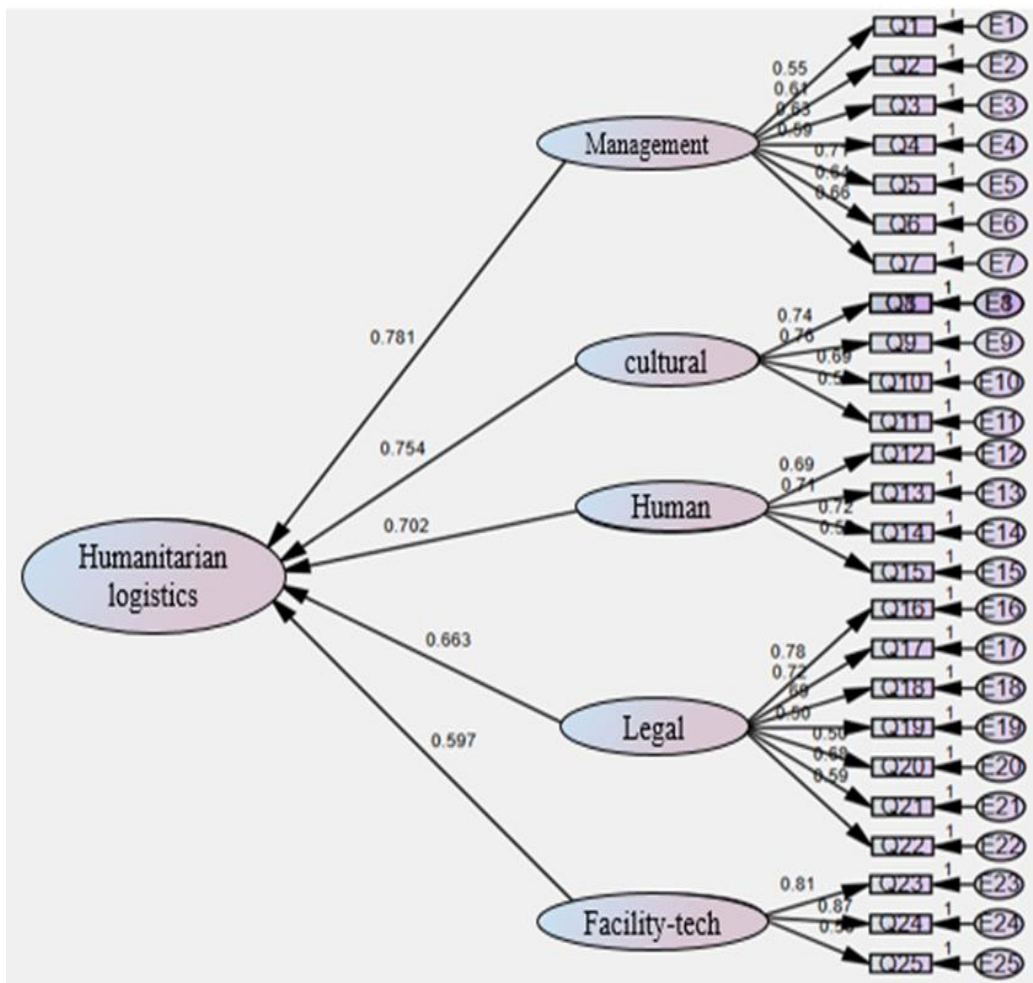


Figure 2. The final research model from AMOS software

**Discussion**

The results show that five management factors, cultural factors, human factors, legal factors, and technical-facility factors can explain 73.075% of the variability (variance) of the variables. Salehi & Khani (2017), mentioned in their research that some factors related to human, managerial, evaluation, cultural, quality, strategy and logistics issues play an important role in improving humanitarian logistics. With this in mind, it can be stated that the factors identified in the current research are similar to the factors identified in Salehi & Khani's research (2017). Due to having a wide audience, athletes have an important and vital role in collecting, managing and distributing aid and services to people. On the other hand, there will undoubtedly be problems in humanitarian logistics.

According to the results of the research, managerial factors with a total effect of 0.781 have the greatest impact on the humanitarian logistics model through Iranian athletes. Yadav & Barve's research (2015) was one of the researches that pointed out that management factors play an important and fundamental role in improving humanitarian logistics. Van Wassenhove (2006), also determined that management factors are one of the important and primary principles of effective disaster management using humanitarian logistics, and inconsistent research was not found.

It seems that management factors, by creating basic infrastructure for the development of humanitarian logistics through athletes, cause this chain to obtain its other needs as well. In other words, the moving wheel of humanitarian logistics is managed by athletes. These factors, by making initial efforts at the level of organizations in charge of sports affairs and crisis management, will resolve some ambiguities in this field and in other words, cover the appropriate order of programs related to this chain. Therefore, it is necessary to have appropriate procedures in attracting athletes to the chain of humanitarian aid, as well as identifying these athletes and inviting them before the crisis occurs and coordinating with them; It is necessary to use the help of these athletes during a possible crisis, and also creating special sports associations for humanitarian logistics through athletes will lead to the regularization and legalization of the actions of athletes during a

crisis.

The research results show the role of cultural factors in the development of humanitarian logistics of athletes in the second place of importance. Social responsibility followed by humanitarian logistics measures is a skill and like any kind of skill, it can be learned and acquired; of course, this skill is gradually developed throughout life, in the sense that a person can never show responsible behavior, unless he has learned it during his life ([Ghanbarpour Nosrati, & Asefi, 2022](#)). In this regard, the mass media is considered an effective factor in creating patterns and culture ([Moradi et al., 2012](#)).

[Singh et al. \(2018\)](#), determined that the formation of humanitarian logistics is mediated by the media. By providing a suitable platform along with a suitable management structure, the media can help in the formation of humanitarian logistics through athletes ([Yadav & Barve, 2015](#)). Therefore, by creating educational content, it is necessary to promote the necessary culture and awareness of athletes in order to be present in times of crisis in humanitarian logistics; also, reflecting the positive behaviors and activities of athletes during the crisis through the national media attracted more athletes and created culture.

Also, the results of the research showed that the role of human factors is in the third place of importance in the development of humanitarian logistics; In this regard, determining clear tasks for athletes in times of crisis and ways to improve the motivation of athletes to participate in humanitarian logistics are important. Let the country benefit. In addition, a suitable database of athletes willing to participate in logistics will be helpful in times of crisis.

According to the results of the research, the role of legal factors in the development of humanitarian logistics by athletes is in the fourth place, and in the direction of humanitarian logistics through athletes, some issues related to laws have an important and decisive role. Undoubtedly, the rules cause the formation of the basic platform for the development of humanitarian logistics through athletes. The nature of humanitarian logistics through athletes has caused us to have a fundamental need to improve legal aspects in order to develop this chain. In this regard, [Singh et al. \(2018\)](#), also pointed out that protective laws improve humanitarian logistics.

Finally, the role of technology factors and facilities in the development of logistics is at the last place, which suggests that by maintaining and improving the communication infrastructure in times of crisis, athletes can be more effective in the development of humanitarian logistics.

The diverse nature of the identified factors for the development of humanitarian logistics through athletes shows that it is important to pay attention to all available dimensions to strengthen the presence of athletes in humanitarian logistics. On the other hand, the importance of the identified factors shows that humanitarian logistics through athletes needs comprehensive planning in this field.

## Conclusion

The use of athletes due to their high influence in the social arena can have a higher executive guarantee in the implementation of humanitarian logistics. Creating management platforms to introduce athletes to humanitarian logistics and increase their awareness in this field can have a profound impact on the development of humanitarian logistics through athletes. Athletes can play an essential role in crisis control and management by using their abilities and potentials. On the other hand, the existence of some problems and inconsistencies regarding the help of athletes and other people during the crisis in some recent incidents in the country suggests that the humanitarian logistics mechanism through the athletes should be implemented in a more regular way in order to benefit of all the potentials of the athletes, to reduce some of the irregularities formed in this field.

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## Conflicts of Interest

There is no conflict of interest.

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