

Investigating the Physical Security Dimensions Affecting Volleyball Stadiums Security

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Abstract. The present study aimed at investigating the physical security dimensions affecting the security of volleyball stadiums in Iran. The study employed a descriptive-exploratory research method conducted on 115 managers and officials in volleyball stadiums, presidents and experts of Provincial Volleyball Boards as well as experts in the field of sports facilities and events as well as sports violence and aggression. They answered a 20-item Physical Security Assessment Questionnaire extracted from the adjusted

Stadium Security Questionnaire (Faraji, 2014). The collected data were analyzed using exploratory and confirmatory factor analysis. The research findings indicated that physical security is one of the main factors affecting the security of volleyball stadiums in Iran. Control of toxic and chemical substances (0.91), internal control (0.90), peripheral environment control (0.70) and court entrance control (0.59) were considered as the most important factors of physical security on the security of volleyball stadiums ($P < 0.05$). It seems that the strict implementation of the security inspection protocol for spectators, the adoption of appropriate security measures in the external environment of volleyball stadiums, the reform of the ticket sales system, and the use of new methods for distributing and selling tickets to control the court entrances can prevent spectators' violent behaviors and increase their satisfaction. As a result, the security of volleyball stadiums can be fulfilled.

Keywords: Security, Violence, Aggression, Volleyball Stadiums, Physical Security.

1. Introduction

Given the wide-ranging reflection of sports events in the mass media, the security available in these events can be seen as an expression of security at the community level (Kargar et al., 2015). One of the most important areas is security, which means organizing events and sports competitions away from any danger and threat. Sports security management investigates the nature and scope of sports security and the issues of sports events such as terrorism (the motivation for terrorist activities, the methods of terrorist activity, and the effect of terrorist acts), natural disasters and issues of disturbances and disorder in sports (Hall et al., 2008). Social phenomena can be affected by various risk factors for various reasons and create problems for society. Sports and sports events can also be affected by these social problems because of their social nature and ultimately create a crisis for society (Shah Mansouri & Mozafari, 2006). Terrorism, hooliganism, vandalism, and population constitutions are among the most important threats to sports events (Hall et al., 2012). The occurrence of such disastrous events in the sports fields is a result of the functioning of the elements and factors affecting the social, economic, political and cultural spheres of society (Shah

Mansouri & Mozafari, 2006) and is not specific to a country or a field of sports, and in most Countries in the world and in almost all sports fields (Emery, 2010). The security of sports facilities and the discipline of stadiums and sports halls and stadiums during tournaments are the most important concerns for sports managers. Physical protection or physical security refers to various protective measures to make sports buildings and places secure and protect their equipment against destruction, disruption and vandalism. Several studies have highlighted the role of physical protection of stadiums in their security. Elahi and Pouraghahi (2004) pointed out in their research that there is a suitable place for physical examination of spectators at the entrance to the stadiums, which assessed the situation in Iran's stadiums, mostly medium and medium to low. Auditors are at the entrance to the stadium in order to prevent the entry of any firearms, cold and firearms, and prevent potential accidents (Naderian Jahromi et al., 2013; Khabiri et al., 2010). According to the rules approved in many countries, people who enter the stadium are subject to physical examination and prevented from entering fans and spectators who have violated the rules (Hall, 2010). In addition to protecting and controlling the stadiums' entrances, inspection and discharging of trash bins and large tanks as well as failure to put them under the buildings and platforms to prevent terrorist motives, 24-hour control of playgrounds and the position of spectators as well as the special status of journalists and reporters by CCTV cameras are important issues in the security of the indoor environment of stadiums (Hall, 2006). Jahromi et al. (2013) and Cieslak (2009) pointed to the use of appropriate fences around the stadiums to protect them physically. Studies show that in many contests of frequent controversies among spectators with each other and, in some cases, with security forces, beatings and trapping of spectators and players, throwing dangerous objects into the hall, spelling out the words of the relics from the audience and players and coaches, attacking equipment such as chairs and, in general, violence have worryingly grown among both spectators and players (Etela'at Newspaper, 2011). As a result, in sports events, it is necessary to take steps to ensure the security of stadiums and sports stadiums against potential accidents. Because the occurrence of an incident, while having a negative impact on the sporting event, is

effective on reducing the presence of spectators in competitions and games in a country (Praditsathaporn et al., 2010).

2. Literature review

Considering the fact that in recent years, Iranian volleyball stadiums host hundreds of thousands of spectators each year to watch the games of domestic leagues and host foreign events in Iran, it is necessary to provide a secure and safe environment for these spectators. Violence and aggression in volleyball is a problem that has grown in recent years and has been at the head of news media; for example, the match between Omran of Sari and Municipality of Urmia teams in the 21st week of the volleyball league due to the events on the platforms (verbal conflicts among spectators and players), Municipality of Urmia players left the court and the match remained unfinished (Nammak News Agency, 2016). In addition, at the end of the Saipa and Kale Amol volleyball tournament, spectators and some of the players started physical conflicts with police officers (ISNA News Agency, 2012). In other events, between the two teams of Peykan of Tehran and Municipality of Urmia in the tenth week of the volleyball league in the fifth set-up, a sharp conflict between the players of the two teams. It caused that the match remain unfinished (ISNA News Agency, 2017). The above-mentioned incidents are only part of the incidents reported in recent years, and it generally seems to be entering firearms and cold weapons into sports venues, throwing objects from spectators, breaking seats and dismantling platforms, starting physical conflicts among spectators, and unfortunate events in Iranian sports stadiums and venues indicate the insecure atmosphere of these stadiums and stadiums for spectators, athletes, coaches, referees and other individuals present there. Frequent observation of these events shows that there are weaknesses and shortcomings in preventing and controlling such events (Faraji, 2014). Therefore, in sports events, it is necessary to take steps to ensure the security of the stadiums and sports stadiums against potential accidents. Because the occurrence of an incident, while negatively affecting the sporting event, is effective on reducing the presence of spectators in sports facilities and stadiums (Praditsathaporn et al., 2010). Hence, conducting systematic studies in this area seems necessary in order to

identify the causes of these incidents as well as their prevention strategies, as well as recognize weak and recoverable points of view in the field of security in volleyball stadiums. The occurrence of security incidents in sports venues, especially volleyball stadiums, challenges the reputation of Iran in international forums; improving the safety of Iran's sports stadiums and venues by conducting such scientific studies and providing a platform for other studies in this field, in addition to preventing the occurrence harmful events in sports halls, protecting the lives of those in them (spectators, athletes, coaches, etc.), and preventing damage to sports infrastructure in sports halls, show the stability and security of Iran and draw a positive image in the whole world. Definitely, improving and upgrading the security system of events and sports venues result in increasing the presence of spectators at the stadiums, the chance to get hosting international events, as well as increasing the welcome of foreign teams to participate in a variety of domestic tournaments. Therefore, in the present research tried to identify the variables related to the physical protection of volleyball stadiums and their role in explaining the security of volleyball stadiums in Iran and, a security enhancement model in these halls can be developed using quantitative analysis of the variables.

3. Method

The research method is descriptive-exploratory. The research population consisted of 392 managers and practitioners of volleyball stadiums in Iran, presidents and experts of Provincial Volleyball Boards as well as experts in the field of sports facilities and events as well as sports violence and aggression. According to The Krejcie and Morgan Table, 115 participants including 64 experts and organizers of volleyball championships in volleyball leagues in Provincial Volleyball Boards, 23 university professors specialized at the management of sports events and venues and violence and aggression in sports, 14 security guards of volleyball stadiums; and 8 volleyball players, coaches, and referees were randomly selected to participate in the study (data related to the organizational positions of 6 participants was unclear). Physical Security Assessment Questionnaire extracted from the adjusted Stadium Security Questionnaire (Farghi, 2014) was employed for collecting data. The

questionnaire consisted of 20 items organized based on the 6-point Likert scale (no importance = 0 to strongly important = 5), which measures four sub-factors affecting the physical security of stadiums (outdoor control, indoor control, entrance control, and toxic and chemical substances control). Both face validity and content validity of the questionnaire were confirmed by experts and its reliability was calculated as $\alpha = 0.99$ via Cronbach's alpha coefficient. The collected data was analyzed using SPSS v-23 and the exploratory factor analysis and then, confirmatory factor analysis was conducted on the data using LISREL v-8.5.

4. Findings

In the present research, exploratory factor analysis (principal components analysis method) was used to determine the factors affecting the physical security of volleyball stadiums. In exploratory factor analysis of the questionnaire, the minimum factor loading acceptable for each item was considered as 0.50. The results of the Bartlett test in Table 1 illustrate that the use of factor analysis is appropriate and the factors made enjoy acceptable validity; hence, the divergent validity of the questionnaire is confirmed. Internal consistency or reliability was also determined using Cronbach's alpha for controlling toxic and chemical agents, outdoor control, indoor control, and entrance control of stadiums were obtained as 0.74, 0.94, 0.92 and 0.94 respectively. The results of the KMO test also showed that the number of samples is sufficient for factor analysis (Table 1).

Table 1. KMO and Bartlett test results in exploratory factor analysis

KMO	Bartlett	
	0.899	Chi-square
df		190
Sig.		0.001

In exploratory factor analysis, two items of the Physical Security Assessment Questionnaire were deleted due to having factor loadings

below the baseline load (0.50) (patrols of police forces around the stadium before the start of the match until the end" and "the existence of security warning systems in the hallways of the stadium"). Other items (18 remaining items) were classified into four factors, namely outdoor control, indoor control, entrance control, and toxic and chemical substances control of volleyball stadiums (Table 2). The indoor control factor explained 20.47%, the control of toxic and chemical factor 19.98%, the outdoor control factor 19.38%, and finally, the entrance control factor explained 14.60% of the variance of physical security factor (74.35% in total).

Tale 2. Items and factors of the Physical Security Assessment Questionnaire

Sub-factor	Variance explanation value	Priority of items in the factor	Items	Mean standard \pm error	Factor loading
Outdoor control	19.38%	1	24-hour surveillance and control of the outdoor area and surrounding area by CCTV cameras	3.51 \pm 1.23	0.681
		2	Use of the check-in and check-out system to drive all vehicles to the courtyard and parking lot	3.34 \pm 1.16	0.831
		3	Identification of vehicle occupants by valid identification cards when entering the courtyard and parking lot	3.33 \pm 1.28	0.774
		4	Inspection of all vehicles when entering the courtyard and parking lot	3.28 \pm 1.21	0.863
Indoor control	20.47%	1	Annual review of the safety and security of the indoor and its facilities	3.81 \pm 1.05	0.679
		2	Supply of security for all indoor and outdoor buildings and systems by security forces	3.75 \pm 0.97	0.647
		3	24-hour monitoring and control of playgrounds and spectators' standing by CCTV cameras	3.59 \pm 1.17	0.507

Sub-factor	Variance explanation value	Priority of items in the factor	Items	Mean standard \pm error	Factor loading
		4	Continuous monitoring of special stations, reporters and reporters by CCTV cameras	3.50 \pm 1.27	0.602
		5	The inspection of halls by the bomber teams before opening the doors	3.48 \pm 1.35	0.686
		6	No deployment of large waste tanks under buildings and platforms to prevent terrorist motives.	3.31 \pm 1.20	0.679
Entrance Control	14.60%	1	Inspection of bags and equipment of reporters and sellers in halls and stadiums	3.94 \pm 1.02	0.820
		2	Physical inspection of the spectators when entering stadiums to prevent the entry of prohibited items	3.85 \pm 1.17	0.823
		3	The strict implementation of the security inspection protocol for spectators, regarding saloon staff and personnel in the match day	3.69 \pm 1.04	0.864
Toxic and chemical substances control	19.98%	1	Safe and secure disposal of chemicals, fertilizers, and gas cylinders	3.59 \pm 1.13	0.602
		2	The presence of hazardous toxic and chemical toxicological equipment in halls	3.37 \pm 1.23	0.787
		3	Sealing the drinking water resources of stadiums to prevent sabotage and terrorist operations	3.33 \pm 1.18	0.899
		4	Inspection and drainage of trash bins and tanks	3.22 \pm 1.31	0.510
		5	Secure and safe elimination and disposal of salinity residues to prevent contamination	3.15 \pm 1.33	0.801

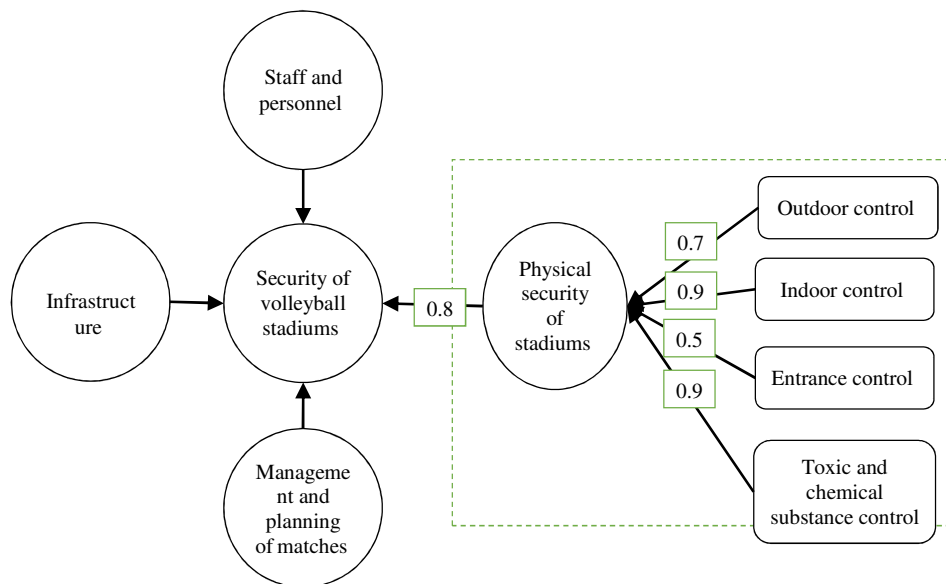
According to Table 2, in the control room environment, the "24-hour surveillance and control of the outdoor area and surrounding area by CCTV cameras" with high priority and the highest mean score was recognized as the most important item in this section. The "Use of the check-in and check-out system to drive all vehicles to the courtyard and parking lot" and "Identification of vehicle occupants by valid identification cards when entering the courtyard and parking lot" had also the next priorities. In the indoor controls factor, "Annual review of the safety and security of the indoor and its facilities" and "supply of security for all indoor and outdoor buildings and systems by security forces" were the most important items. "Inspection of bags and equipment of reporters and sellers in halls and stadiums ", and "physical inspection of the spectators when entering stadiums to prevent the entry of prohibited items" were the most important issues in controlling the entrance of stadiums. "Safe and secure disposal of chemicals, fertilizers, and gas cylinders" and "the presence of hazardous toxic and chemical toxicological equipment in halls" were among the most important priorities for the control of toxic and chemical substances. Mardia's Coefficient was employed for determining multivariate normalization. According to the critical ratios obtained for each variable (C.R <2.58), the assumption of non-normality of the data distribution was rejected. In order to study the multicollinearity between the independent variables of the variance inflation factor (VIF) and tolerance parameters were used. According to the VIF table, the variance of all independent variables is smaller than 10 and their tolerance parameter is bigger than zero and close to 1, which indicates a low level of multicollinearity between independent variables (Table 3).

Table 3. Multicollinearity in predictive variables

Tolerance parameter	VIF	Variable
0.414	2.41	Outdoor control
0.275	3.63	Indoor control
0.662	1.51	Entrance control
9.347	2.88	Toxic and chemical substances control

After exploratory factor analysis and identification of factors related to physical security of volleyball stadiums, Structural Equation Modeling

(SEM) (first and second order confirmatory factor analysis) was used to test the research hypotheses and, finally, to present a model (Figure 1).



	χ^2	df	χ^2/df	P-value	RMSEA	NFI	NNFI	GFI	AGFI
First order factor analysis	134.88	48	2.81	0.0001	0.126	0.95	0.95	0.84	0.83
Second order factor analysis	0.64	2	0.32	0.727	0.001	1.00	1.00	1.00	0.99

Figure 1. The model of the influence

In first-order factor analysis, the latent structures (physical security of stadiums) is explained by subsidiary factors (outdoor, indoor, entrance, and toxic and chemical substance controls of volleyball stadiums) affecting it. According to the results of this section, the main factor of toxic and chemical substances control has the highest factor loading as (0.91), and the sub-factor of entrance control has the lowest factor loading as (0.59) for the physical security component of volleyball stadiums. In the second order factor analysis, the latent construct (security of volleyball stadiums) is explained by the factors influencing the physical security factor (factor loading= 0.84). The fitness indices of the first and second order confirmatory factor analysis model (Figure 1) showed that this model has acceptable validity and reliability, hence this model is confirmed based on the above indicators. Using the results of first-order confirmatory factor analysis, the convergent validity of this

model can also be verified. Two criteria are considered for convergent validity (Ramin Mehr & Charstad, 2013): The value of factor loadings for each (latent) variable must be bigger than 0.5 and ideally larger than 0.7. Regarding the software output in the standard mode, it can be seen in Figure 1 that the factor loadings of all the sub factors are bigger than 0.7 for the explanation of the four main factors (four first-order latent variables). The Average Variance Extracted (AVE) for each variable that must be bigger than 0.5, is calculated via the equation:

$$AVE = \frac{\sum_{i=1}^n \lambda_i^2}{n}$$

Where,

λ_i = factor loading

N= number of observed variables of each latent variable

Using the above equation, the average of the extracted variance for the physical security variable is calculated as follows, and since the AVE value in the first-order factor is bigger than 0.5, convergent validity of this construct is confirmed.

$$\begin{aligned} \text{AVE of security} &= \frac{(0.70)^2 + (0.90)^2 + (0.59)^2 + (0.91)^2}{4} \\ &= \frac{0.49 + 0.81 + 0.34 + 0.82}{4} = 0.61 \end{aligned}$$

For investigating discriminate validity of the model, AVE was compared with square (second power) correlation between the observed variables. In this case, if AVE is bigger than the square of the coefficient of correlation between the variables, discriminate validity is observed for that variable (Ramin Mehr & Charstad, 2013).

Table 4. Comparison of AVE

Toxic and chemical substances control	Entrance control	Indoor control	Outdoor control	
			0.61 = AVE	Outdoor control
		0.61 = AVE	0.46 = R2	Indoor control
	0.61 = AVE	0.26 = R 2	0.14 = R2	Entrance control
0.61 = AVE	0.30 = R	0.59 = R2	0.39 = R2	Toxic and chemical substances control

Table 4 shows that AVE = 0.61 in the physical security construct is

bigger than the correlation coefficient between its variables; therefore, the physical security construct has a discriminant validity in the first order confirmatory factor analysis model. After verifying validity of the questionnaire, the following equation was used to confirm the Construct Reliability (CR) of the structure; it should be noted that construct reliability is a criterion for determining the internal consistency of the observed variables and based on a rule of thumb, its value should be bigger than 0.7 in order that it can be claimed that there is internal consistency or construct reliability (Ramin Mehr & Charstad, 2013).

$$CR = \frac{(\sum_{i=1}^n \lambda_i)^2}{(\sum_{i=1}^n \lambda_i)^2 + (\sum_{i=1}^n \delta_i)}$$

Where,

λ_i = factor loading

δ_i = error of the observed variable

$$\begin{aligned} & \text{CR of security} \\ &= \frac{(0.70 + 0.90 + 0.59 + 0.91)^2}{(0.70 + 0.90 + 0.59 + 0.91)^2 + (0.51 + 0.20 + 0.65 + 0.17)} \\ &= \frac{9.61}{9.61 + 1.53} = 0.86 \end{aligned}$$

Given that the numbers obtained from the equation of construct reliability of the staff and personnel are bigger than 0.7, the reliability of the above construct is confirmed in the first order factor analysis. The results of testing research hypotheses are presented in Table 5. According to the results, outdoor control, indoor control, entrance control, and toxic and chemical substances control of volleyball stadiums as the independent variable affects the physical security of volleyball stadiums ($p < 0.05$) and, accordingly, research hypotheses are confirmed. Moreover, the physical security factor of the stadiums also had a significant effect on the security of the volleyball stadiums ($P < 0.05$). The results also showed that determination coefficient of outdoor control, indoor control, entrance control, and toxic and chemical substances control of volleyball stadiums were 0.49, 0.81, 0.34 and 0.82, respectively.

Table 5. Results of testing research hypotheses

Independent variable		Dependent variable	Standardized factor loading	Determination (R ²) coefficient	t-statistic	Results of testing hypothesis
Physical security of stadiums	→	Security of stadiums	0.84	0.70	10.97	Confirmed
Outdoor control	→	Physical security	0.70	0.49	8.43	Confirmed
Indoor control	→	Physical security	0.90	0.81	12.08	Confirmed
Entrance control	→	Physical security	0.59	0.34	6.75	Confirmed
Toxic and chemical substances control	→	Physical security	0.91	0.82	12.42	Confirmed

5. Discussion and Conclusions

Security of sports events and venues during tournaments is one of the major challenges faced by sports event managers. Considering the events and incidents occurring in indoor and outdoor sports venues, the existence of a security system in sports events is inevitable. The findings of the present study showed that physical security of volleyball stadiums is one of the main factors affecting security of volleyball stadiums in Iran. Physical protection or physical security refers to various protective measures to protect stadiums, buildings, places, installations, and equipment against destruction, disruption and vandalism. This includes four subcontinents called "outdoor control", "indoor control", "entrance control" and "toxic and chemical substances control" of volleyball stadiums. Several studies have pointed to the role of physical protection in securing the stadiums (e.g. Hematti Nejad et al., 2016; Kargar et al., 2016). The research findings indicated that the sub-factor of toxic and chemical substances control with a factor loading as 0.91 is the most important in this factor. Protecting sports venues against toxic substances is part of the security programs for sports facilities. The strict implementation of the inspection protocol for spectators, safe storage and availability of chemicals, the availability of hazardous toxic and chemical detection equipment, and ultimately safe and proper disposal of food residue in volleyball halls to prevent the spread of contamination are among the most important programs for prevention of pollution and improving the safety of volleyball halls. In his research, Cieslak (2009) pointed out issues such as the regular inspection of bins and waste tanks

use of bomber dogs, and the equipment for detecting biological, chemical and radioactive substances to enhance security of stadiums. Sealing drinking water resources in the stadiums for hindering sabotage and terrorist operations, safe and proper disposal of food residues for preventing contamination, and safe and out-of-reach storage of chemicals, fertilizers and gas cylinders in stadiums are the most important programs for the prevention of contamination or bioterrorism are among the most important programs for preventing contamination or bioterrorism (Hall, 2006). Indoor control methods were identified as the second main factor in physical security of stadiums in the present study with factor loading as 0.90. According to the participants' answers, the annual inspection of indoor security, security forces' inspection of the buildings and indoor vulnerable systems, 24-hour monitoring and control of playground and spectators' position, inspection of special positions of reporters by CCTV cameras, and bomber teams' inspection of stadiums before opening the doors are of particular importance in securing the indoor environment of volleyball stadiums. Taking them into consideration may resolve security problems inside volleyball stadiums. The outdoor control sub-factor, with factor loading as 0.70, was the third one affecting the physical security of volleyball stadiums. Regarding the importance of the outdoor control of stadiums, Jahromi et al. (2013) suggested the outdoor control or security belt about 300 meters around stadiums. Supervising and controlling outdoor areas of volleyball stadiums by CCTV cameras, use of check-in and check-out systems for the transport of all vehicles to the parking lot, and identification of vehicle occupants by valid identification cards are among important variables in the of entrance control sub-factor which plays a significant role in ensuring their security. In Hemmati Nejad et al. (2016), Naderian Jahromi et al. (2013), Hall et al. (2006) and Pantera et al. (2003), similar cases in this field are discussed. Naderian Jahromi et al. (2013) and Cieslak (2009) also pointed to the use of appropriate fences around stadiums for physical protection. In their study, Andam and Salimi (2015) referred to proper design of entry-exit gates for stadiums and their appearance, fencing and appropriate physical protection in the stadium, the installation of scoreboards, proper nutrition stations, and construction of sanitary facilities as effective

factors in reducing the behavioral anomalies of spectators and, consequently, the increase in security of stadiums. The access routes (entrance) control sub-factor with factor loading as 0.59, is the last one affecting the physical security of volleyball stadiums in the present study. In order to control the entrances of volleyball stadiums, variables such as physical inspection of spectators, the inspection of bags and packs related to media reporters and sellers, and the strict implementation of the security inspection protocol for spectators regarding the staff and personnel of stadium in the day of matches are among the most important issues in this sub-factor. Given the fact that the ticket sales system of most Iranian stadiums is outdated, it seems that in case of reforming the ticket sales system and the use of new methods of distributing and selling tickets, many problems related to overcrowding in entrances and its consequent disorders can be solved (Faraji, 2014). Many researchers, Hemmati Nejad et al., 2016; Nadarian Jahromi et al., 2013; Elahi and Pour Aghaei, 2004; Hall, 2006; Pantera et al., 2003, pointed out that entrance control of stadiums is effective on securing the stadium. Preventing and controlling the entry of fanatical and dangerous spectators into the stadium, inspection of the spectators physically for preventing the entry of high-risk objects to stadiums, training spectators how to behave properly, using force and arresting guilty spectators by police and security guards are measures for coping with spectators' violence and insecurity in stadiums. These issues have been discussed in the studies of Ramadan Oghlu (2012), Yusuf (2016) and Tarmizi et al. (2017). Naderi Jahrimi et al. (2013) included installation of physical protection systems and entrance controls as indicators and standards for safety and security of sports venues. According to the rules and regulations of many countries, people who enter the stadium are subject to physical inspections and those who have violated the rules are prevented from entering stadiums (Hall et al., 2010). According to Hall et al. (2012), precautionary measures vary according to the location of the sports events, capacity of stadiums, sports event types, and the amount of resources available (Hall et al., 2012). Security costs related to the implementation of protective measures, such as the recruitment and use of security guards and forces, physical protection systems, control of space around stadiums, access

control of stadiums, risk management, status management, emergency management, population management, and traffic control (Hall et al., 2012). Hall et al. (2010) suggested using technologies such as CCTV cameras, an equipped control room, an automatic fire and alarm system, single pass and electronic gates, an electronic ticket sales system with electronic tickets, etc. as the most important security factors for the stadiums in UK. Khabiri et al. (2010), studying the potential hazard of the Iranian football stadiums, concluded that there were no proper guides and signs in the Iranian stadiums, and in most of those stadiums, no numbered seats is available for spectators. The researchers believe that without numbered seats, spectators may rush towards seat and disorder begins when they are going to sit. In addition, the exact numbering of chairs allows security guards to quickly enter the event of any disorder. Nowadays, in many of the stadiums of UK, in addition to the above technologies, Face-Trac devices are employed for recognizing fans. Moreover, a database related to spectators is used. It is very efficient in promoting the security of these stadiums (Hall, 2010). Using CCTV cameras to monitor and control the whole stadium, as well as the use of an electronic ticket control system to prevent overcrowding at the entrance of stadiums are the most important steps used in Australian sports stadiums (Cieslak, 2009). Generally speaking, more research on stadium security, as well as issues related to the control of violence and aggression in stadiums, has focused on the use of CCTV technology (Naderian Jahromi et al., 2013; Hall et al., 2010; Cieslak, 2009). Finally, according to the findings of the present study, it is recommended that the sports authorities of Iran, especially the volleyball federation and the organization of volleyball league, should carefully implement the security inspection protocol of the spectators, adopt appropriate security measures in the external environment of the stadium and modify the ticket sales system and use new methods of distribution and sales tickets for better control volleyball venues can both prevent spectators' violent behaviors and increase their satisfaction for improve security of volleyball stadiums.

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