

## Provision of an Integrated Health, Safety, and Environment Management Model in Sports Facilities in Iran

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### A-R-T-I-C-L-E-I-N-F-O

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**Background & Aims of the Study:** The system of safety management, health, and the environment is one of the most effective management systems that can be emphasized to create an environment that identifies, evaluates, eliminates or controls all the factors of injury so as to ensure the health, safety, and environment of the sports facilities. Therefore, the present study aimed to present an integrated model of HSE management in sports facilities in Iran.

**Materials and Methods:** The research method was mixed and based on structural equation modeling. The statistical population of the study consisted of all professors, coaches, supervisors, managers, and experts of sports facilities in 2019. Due to the large statistical population, after designing a researcher-made questionnaire, a total of 561 questionnaires were distributed electronically and in-person among the statistical population. According to the number of completed questionnaires, the number of statistical population in the present study reached 400 subjects. Data analysis was performed using SmartPLS (version 3) and SPSS software (version 20).

**Results:** As evidenced by the obtained results, the impact of the three main dimensions, namely deployment of related technologies (modern antecedents), deployment of management system (core components), and improvement of management culture (HSE) and its sub-dimensions on the health, safety, and environmental management system of sports facilities were confirmed.

**Conclusion:** As illustrated by the obtained results, it can be concluded that the use of integrated model (HSE) in sport facilities can have a suitable and practical position among sport managers in three dimensions (deployment of related technologies, deployment of management system, and improvement of HSE management culture). Therefore, proper scientific planning and strategy for the development of integrated model (HSE), especially in sports facilities, can be identified as the highest strength of managers in this field.

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## Background

Sports organizations, sports leagues, and other sports agencies at the international level have implemented numerous programs in the field of environmental protection along with implementing place management programs to maintain the health and safety of athletes and gain their own financial benefits (1, 2). Ample evidence suggests that sports science in Iran is in its infancy, and physical education is still practiced in a traditional manner in many areas and places in this country (2, 3). Although this field has undergone considerable changes by the adaptation of different criteria and standards, it is still far from universal ideals. Sports facilities and venues in Iran are no exception and are a long way from reaching international standards. Therefore, one of the most important concerns of sports facility managers is ensuring the safety and health of spectators and participants in sports events along with protecting the environment, hygiene, and safety (4, 5).

The traditional view on sport in Iran has resulted in non-standard and dangerous obstacles and equipment, inadequate and unsafe surfaces, failure to comply with playground fencing Standards, use of obsolete instruments, and the installation of inadequate ventilation systems. All of the mentioned factors have reportedly caused collapses, sports injuries, fatalities, and other irreparable losses. These consequences are indicative of insufficient attention devoted to safety (2). Moreover, the lack of compliance with health and medical standards in sports facilities has resulted in the spread and incidence of communicable skin and respiratory diseases. Although these statistics are not established, they have been highlighted in many academic reports (6, 76).

Health, safety, and environment (HSE) management system has been recently implemented in some recreational and

religious places in Iran; nonetheless, it has not received the attention it deserves. If this system becomes compulsory in sports facilities, it would be of great help in developing championship and public sport and minimizing human and environmental accidents (7, 8). HSE is one of the most complete and effective management systems that can be used to create an environment where all potential causes of harm are identified and evaluated. Thereafter, they would be eliminated or controlled to ensure the health, safety, and environment of sports facilities (9-11). The HSE management system reduces costs and risks and increases safety, health, and opportunities; moreover, it provides an integrated and secure audit. When these three issues come together under integrated management, they would have significant synergistic effects, and the positive effects of its algebraic sum would be far greater, as compared to the past (11-13).

The HSE management system has a roadmap and a three-stage evolutionary course. As passing through these stages, the occurrence of incidents and the number of existing safety, health, and environmental hazards decrease.

Firstly, the deployment of HSE-related technologies includes engineering improvements, hardware and software improvements, and compliance with health, safety, and environmental requirements. The second step is the establishment of the HSE management system, including integrations, competence, assessment, and risk management.

The last stage of the effective implementation of the HSE system is the improvement and deployment of the HSE culture which consolidates and improves the performance of all its elements. This phase includes the improvement of attitudes and behaviors, as well as an increase in commitment, leadership, and accountability. HSE culture is often cited as a key factor in determining the safety, health, and environmental performance of a community.

HSE culture is the product of individual and group values, attitudes, competencies, and behavioral patterns that determine HSE programs (14, 15).

All provincial centers recently received a circular from the Green Management of the Department of Sports and Youth and were asked to implement the circular in provincial Youth and Sports Departments and all sports complexes and facilities affiliated to this department (16, 17).

Taking part in sports and competitions in places without technical and hygiene standards increases the health problems of the community and causes various diseases, instead of improving the quality and quantity of health. On the other hand, organizations are socially responsible for minimizing harmful environmental products. Consequently, the establishment of an integrated HSE management system in sporting facilities is the only way to achieve the desired level of performance goals which is not in conflict with safety, health, and environment. The achievement of an acceptable level of health, safety, and environmental management standards in sports facilities and their implementation requires fundamental changes in the insights and attitudes of managers in this sector. With this background in mind, the provision of an executive version of the integrated HSE management system in this section seems necessary.

Consequently, in order to implement this system and provide such a version, it is of utmost importance to conduct a study to investigate and update the technologies needed to deploy such a system and examine the components of deployment of the system and its consequences. Therefore, the present study was conducted to fill the aforementioned void with the aim of presenting an integrated model of HSE management in sports facilities from the perspective of senior sport managers.

As mentioned earlier, the present study had a mixed-methods research design due to the lack of similar research. Research questionnaire and a theoretical model were explored in the qualitative phases after interviews with experts. Thereafter, based on that, the researcher completed the model components to illustrate the concept of the HSE management system in sports facilities. The model has three dimensions, including technologies necessary to establish and comply with HSE criteria in sports facilities, the requirements of establishing an HSE management system in sports venues, and determining the enhancing components of HSE management culture in sports facilities.

The main aspects of the HSE management system in the present study included: 1) the deployment of related technologies, 2) establishment of the management system, and 3) improvement of HSE management culture. The subcomponents of the first aspect were legal and ethical requirements, engineering improvements, ergonomics, health requirements, safety requirements, standardization, waste, as well as hardware and software improvements. The subcomponents of the second aspect were establishing system competency, system integration, as well as risk assessment and management. Finally, the third aspect encompassed culture consolidation and attitude improvement.

It is noteworthy that these dimensions were obtained by the review of theoretical literature and interviews with HSE experts. The theoretical model of the research was developed after the qualitative phase based on the content analysis of the interviews with sports experts. Thereafter, it was quantitatively tested in the quantitative phase of the research to achieve more generalizability. Consequently, the three dimensions of the HSE management system in

## Materials & Methods

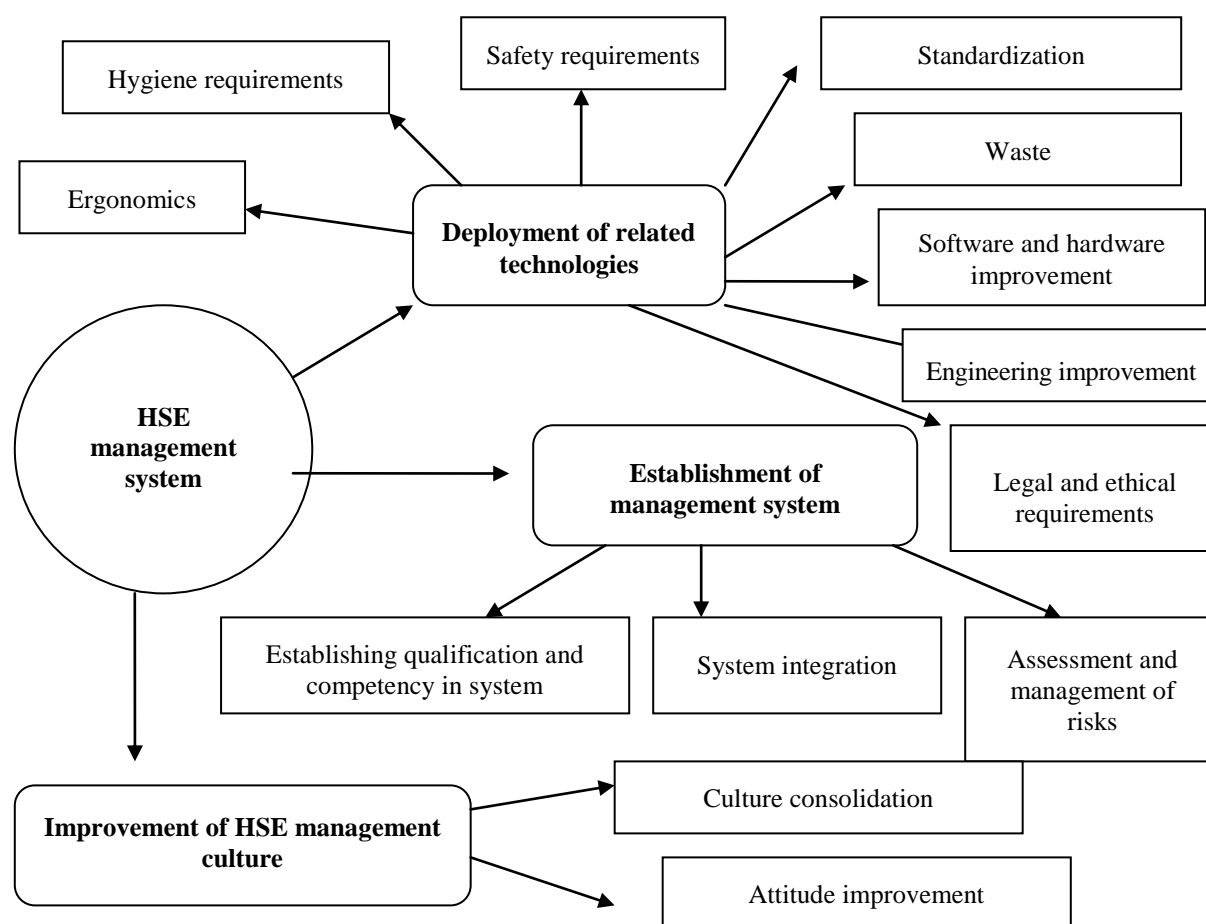


Figure 1) Initial dimensions of research model (2, 15, 16)

sports facilities were elaborated. Figure 1 illustrates the basic dimensions of the model the components of which are explained in two phases, namely qualitative and quantitative.

The present study was descriptive correlational which was based on structural equation modeling. In terms of purpose, it fell into the category of applied research, and it was a field study regarding performance.

### ***Sampling method, population, and statistical sample in the qualitative stage***

The sampling method in this study was purposive. In this phase, 44 physical education teachers, senior managers of the Ministry of Sport, and sports and health managers were interviewed. They were

experts in HSE of places, especially sports facilities. It is noteworthy that these individuals were experts in compliance with HSE programs in facilities and had authored articles and books. Their competency was confirmed by advisors and supervisors after the assessment of their research resume. The researcher stopped interviewing participants after data saturation.

Upon the completion of interviews and literature review, the data were entered into MAXQDA software (version 12). Interview and textual data were coded in the theory analysis process. Data encoding was accomplished in three stages: open coding, axial coding, and selective coding. The questionnaire structure was formed. Interviewees included professors

(n= 22), senior managers (n=11), coach (n=5), supervisor (n = 6) all of whom were experts in sport facilities.

### ***Sampling method, population, and statistical sample at the quantitative stage***

The sampling method was purposive. Inclusion criteria were knowledge of HSE management system, the experience of sports facilities management, and executive experience in sporting events. On the other hand, the exclusion criteria included unwillingness to participate in the study and answer the questions honestly. After extracting the mentioned factors from the qualitative phase of the research, the questionnaire was reduced to 80 questions from the 277 questions, and it was finally approved by advisors and supervisors. However, content validity, face validity, and the initial reliability of the questionnaire were determined using the opinions of 15 sport management professors. Cronbach's alpha test was used to assess reliability.

Questionnaire is one of the common data collection tools in field research. To this end, by studying literature, research backgrounds, and qualitative analysis in MAXQDA software (version 12), and applying the opinions of advisors and supervisors, a standard questionnaire was developed. The questionnaire was scored on a five-point Likert scale (extremely high, high, average, low, and extremely low). For ranking, a total of 561 questionnaires were distributed electronically and in-person among the available teachers, coaches, supervisors, administrators, and sports experts. Out of 414 electronic questionnaires, 260 were returned and 154 questionnaires were non-answered. Moreover, out of 147 in-person questionnaires, 140 were answered correctly and 7 were non-answered. The sample size of the research in this study reached 400 people who were experts in sporting facilities.

As noted above, to collect data and information for analysis, a researcher-made questionnaire was used which consisted of two

parts: general and specialized questions. Five general questions (including age, gender, the field of study, level of education, and work experience) aimed to collect general and demographic information about respondents. In addition, 80 specialized questions in the field of HSE management system attempted to assess the dimensions of the HSE management system in sports facilities.

The specialized questions were designed in three main dimensions: deployment of related technologies (modern antecedents), deployment of management systems (core components), and the improvement of HSE management culture (antecedents). The first domain involved such sub-components as legal and ethical requirements, engineering improvement, ergonomics, HYGIENE requirements, safety requirements, standardization, waste management, and hardware and software improvement. The second dimension, the deployment of management systems, included such sub-components as establishing qualification and competency in the system, system integration, and risk assessment. Finally, the dimension of HSE management culture encompassed the subcomponents of culture consolidation and attitude improvement.

Face and content validity, as well as structural validity of the questionnaire, were determined using the opinions of 12 sport management professors and supervisors. Cronbach's alpha test was used to assess reliability. The calculated Cronbach's alpha values for the whole questionnaire and every domain are presented in Table 1.

Descriptive and inferential statistics were used in the current study. Data were analyzed in SmartPLS and SPSS software (version 20). The relationships among research variables were investigated using structural equation modeling in SmartPLS software (version 3).

## **Results**

Frequency distribution of individual



characteristics of the participants showed that study subjects included 400 provincial managers of the Department of Sport and Youth of Tehran, Kordestan, Golestan, Markazi, and Mazandaran provinces who had the office in 2018. Regarding age, the highest frequency of managers was related to the age range of 31-40 (35.75%) and the lowest to the managers over 60 years with 5.5%. It is worthy to note that most of the managers were male.

With respect to gender, 82% of subjects were male and only 18% were female. Regarding the field of study index, 79.25% of the cases held a degree in Physical Education and sports science out of whom 13.5% were female and 65.75% were male. Only 20.75% of subjects had other degrees out of whom 4.5% were female and 16.25% were male. In terms of education, bachelor's degree with 45% had the

highest frequency, followed by master's degree with 35%. On the other hand, associate's degree with 3.25 % had the lowest frequency.

In terms of work experience index, the highest frequency was in the range of 16-20 years of work experience with 48.75% and the lowest frequency in 1-5 years with 4.5%. In order to verify the results, the normality of the data was initially evaluated. Thereafter, confirmatory factor analysis was used to confirm that the questionnaire questions were able to measure what we intended. Finally, using structural equation modeling, the rejection or non-rejection of the null hypothesis due to the absence of sufficient reasons was discussed.

The results of the statistical tests in Table 2 indicate that most of the variables in the research do not have acceptable normal statistical distribution. It should be noted that

Table 1) Cronbach's alpha test

Questionnaire	Questionnaire (main factor)	Number of questions	Cronbach's alpha	Combined reliability	Questionnaire domains (Sub-Factors)	Number of questions	Cronbach's alpha	Combined reliability
Researcher-made questionnaire	A) Deployment of related technologies (modern antecedents)	60	0.858	0.724	A.1. Hygiene requirement	12	0.676	0.746
					A.1.1. Environmental hygiene	5	0.514	0.566
					A.1.2. Personal hygiene	7	0.588	0.654
					A.2. Software and hardware improvement	7	0.702	0.692
					A.2.1. Hardware	4	0.542	0.604
					A.2.2. Software	3	0.642	0.726
					A.3. Ergonomics	3	0.534	0.793
					A.4. Engineering improvement	4	0.656	0.525
					A.5. Safety requirement	7	0.828	0.685
					A.6. Risk management	3	0.694	0.848
					A.7. Ethical and legal requirement	4	0.730	0.504
					A.8. Environmental requirement	9	0.870	0.745
					A.9. Standardization	5	0.752	0.516
					A.10. Waste management	6	0.812	0.645
					B.1. Development of qualification and competency	4	0.532	0.562
	B) establishment of a management system (Main components)	7	0.720	0.524	B.2. System integration	3	0.796	0.622
	C) Improving HSE Management (Predictability)	13	0.844	0.704	C.1. Culture consolidation	10	0.908	0.808
					C.2. Attitude improvement	3	0.626	0.596

Table 2) Results of the normality of the variables in the study

Questionnaire	Statistical analysis	z-value	P-value
	Dimensions and domains of the Integrated Model Questionnaire(HSE)		
<b>Researcher-made Questionnaire of Integrated Model (HSE)</b>	A) Deployment of related technologies (modern antecedents)	1.144	0.146
	A.1. Hygiene requirements	2.795	0.0001
	A.1.1. Environmental hygiene	4.084	0.0001
	A.1.2. Personal hygiene	3.697	0.0001
	A.2. Software and hardware improvement	3.635	0.0001
	A.2.1. Hardware	4.129	0.0001
	A.2.2. Software	4.483	0.0001
	A.3.Ergonomic	5.724	0.0001
	A.4. Engineering improvement	4.263	0.0001
	A.5. Safety requirement	2.820	0.0001
	A.6. Risk management	4.667	0.0001
	A.7. Ethical and legal requirement	4.819	0.0001
	A.8. Environmental requirement	3.394	0.0001
	A.9. Standardization	4.500	0.0001
	A.10. Waste management	3.827	0.0001
	B. Establishment of management system (main components)	2.820	0.0001
	B. 1. Establishing the competence of the system	4.411	0.0001
	B.2. System Integration	5.074	0.0001
	C. Improving the HSE Management Culture (antecedents)	2.470	0.002
	C.1. Culture consolidation	2.292	0.0001
	C.2. Attitude improvement	4.989	0.0001

the use of structural equation analysis software does not require normal or abnormal data verification, and its results are not sensitive to data normality or abnormality. Accordingly, there is no need to report the normality or abnormality of data. The T-test in SPSS software is used for normal data, whereas the binomial test is applied for abnormal data. Since it was initially decided to use SPSS software, the data normality was examined. Finally, structural equation modeling was used based on the results obtained from the normality of the data in Table 2. Following is a confirmatory factor analysis of the first-order questionnaire constructs:

Subsequently, before the path analysis test, confirmatory factor analysis was used to evaluate the questions used in the measurement instrument (questionnaire) separately for the research variables in terms of model fitting. The results of this analysis are depicted in Table 3. In the partial least squares (PLS) approach, the quality and model fitting are measured using two indices of CV-Redundancy and CV-

Communality, and the values of the mentioned indices are illustrated in Table 3.

As displayed in Table 3, the values obtained for the indices of CV-Redundancy, which demonstrates the quality of the structural modeling, and the CV-commonality are all positive indicating the good quality of the test model. The results of the model test in the form of direct path coefficients along with the t-statistic of hypotheses related to the model paths are demonstrated in Table 4.

According to the interpretive model in structural equation modeling, if the T-statistic value of a path is greater than 1.96, it can be concluded that the path is significant at the 95% level, and the hypothesis for that path is confirmed. Based on the above results (Table 4), it can be concluded that there is a positive and significant relationship among the questions of fourteen domains discussed in the presentation of the Integrated Management Model (HSE), as well as all the discussed

Table 3) Values of CV-Redundancy and CV-Commonality indices for the research model variables

Questionnaire	Questionnaire (main factor)	Variables	CV-Redundancy	CV-Commonality
Researcher-made questionnaire	A) Deployment of related technologies (modern antecedents)	A.1. Hygiene requirement	0.149	0.089
		A.1.1. Environmental hygiene	0.189	0.146
		A.1.2. Personal hygiene	9.226	0.129
		A.2. Software and hardware improvement	0.121	0.177
		A.2.1. Hardware	0.183	0.149
		A.2.2. Software	0.189	0.106
		A.3. Ergonomic	0.126	0.124
		A.4. Engineering improvement	0.221	0.183
		A.5. Safety requirement	0.218	0.164
		A.6. Risk management	0.152	0.108
	B) establishment of a management system (Main components)	A.7. Ethical and legal requirement	0.136	0.122
		A.8. Environmental requirement	0.243	0.194
		A.9. Standardization	0.128	0.116
	C) Improving HSE Management (Predictability)	A.10. Waste management	0.234	0.196
		B.1. Development of qualification and competency	0.208	0.114
		B.2. System integration	0.142	0.186
		C.1. Culture consolidation	0.166	0.129
		C.2. Attitude improvement	0.214	0.172

Table 4) Values of direct path coefficient and t-statistic hypotheses related to integrated management model (HSE) paths

Path	Relationship	Path coefficient	T-value	P-value
1	Integrated Management (HSE) → A) Deployment of related technologies (HSE)	0.956	42.817	0.0001
2	Integrated Management (HSE) → B) Establishment of Management System (HSE)	0.691	12.817	0.0001
3	Integrated Management (HSE) → C) Improving the Management Culture (HSE)	0.650	8.567	0.0001
4	A) Deployment of related technologies → A.1. Hygiene Requirements	0.685	4.535	0.0001
5	A.1. Hygiene Requirements → A.1.1 Environmental Health	0.707	8.346	0.0001
6	A.1. Hygiene Requirements → A.1.2 Personal hygiene	0.750	6.811	0.0001
7	A) Deployment of related technologies → A.2 Hardware and software improvement	0.728	6.307	0.0001
8	A.2 Hardware and software improvement → A.2.1 Hardware	0.720	12.764	0.0001
9	A.2 Hardware and software improvement → A.2.2 Software	0.828	14.544	0.0001
10	A) Deployment of related technologies → A.3 Ergonomics	0.804	11.560	0.0001



Table 4) Continued

11	A) Deployment of related technologies	➔	A.4. Engineering improvement	0.644	4.612	0.0001
12	A) Deployment of related technologies	➔	A.5. Safety requirements	0.698	2.806	0.0001
13	A) Deployment of related technologies	➔	A.6. Risk management	0.588	1.994	0.0001
14	A) Deployment of related technologies	➔	A.7. Ethical and legal requirements	0.842	34.735	0.0001
15	A) Deployment of related technologies	➔	A. 8.Environmental requirements	0.752	6.286	0.0001
16	A) Deployment of related technologies	➔	A.9. Standardization	0.622	4.650	0.0001
17	A) Deployment of related technologies	➔	A.10. Waste management	0.522	3.482	0.0001
18	B) Establishment of a management system	➔	B.1. Developing competence and qualification	0.864	10.524	0.0001
19	B) Establishment of a management system	➔	B.2. System Integration	0.685	6.496	0.0001
20	C) Improvement of management culture	➔	C.1. Culture consolidation	0.814	12.244	0.0001
21	C) Improvement of management culture	➔	C.2. Attitude improvement	0.754	10.826	0.0001

components. The path coefficients of the impacts of the questions (factors) in each dimension and domain on the integrated management model (HSE) are outlined in Table 4. According to the results of Table 4, the following results are obtained:

There is a significant relationship between integrated management (HSE) and the deployment of related technologies (modern antecedents) in sport facilities

There is a significant relationship between integrated management (HSE) and the deployment of the management system (core components) in sports venues.

There is a significant relationship between integrated management (HSE) and improved management culture (HSE) (antecedents) in sports facilities.

There is a significant relationship in sports facilities between the dimensions of

deployment of related technologies (modern antecedents) of the Integrated Management Model (HSE) and each of the following components: A.1. Hygiene requirements, A. 2. Improvement of hardware and software, A. 3. Ergonomics, A. 4. Engineering improvement, A. 5. Safety requirements, A. 6. Risk management, A.7. Legal and ethical requirements, A. 8. Environmental requirements, A. 9. Standardization, and A. 10. Waste Management.

There is a significant relationship between the dimensions of management system deployment (core components) of the integrated management model (HSE) and the sub-components of B.1. Establishing qualification and competency in system and B. 2. System integrity in sports facilities.

There is a significant relationship between the improvement of the HSE management culture (antecedents) and the deployment of the

**Table 5) Values of Explanation Coefficient Indices and Modified Explanation Coefficient for Integrated Management Model (HSE) Variables**

Questionnaire	Dimensions of the questionnaire	variables	coefficient of determination R <sup>2</sup>	Modified coefficient of determination
Researcher-made questionnaire	A) Deployment of related technologies (modern technologies)	A. Health Requirements	0.769	0.766
		A.1 Environmental Health	0.818	0.815
		A. 1-2 Personal hygiene	0.622	0.618
		A. Improvement of hardware and software	0.749	0.746
		A.1-2Hardware	0.729	0.726
		A.2.2 Software	0.663	0.659
		A.3 Ergonomics	0.849	0.847
		A. 4. Engineering improvement	0.871	0.870
		A. 5.Safety requirements	0.875	0.873
		A. 6. Risk management	0.797	0.795
	B) establishment of a management system (the main components)	A.7. Legal and ethical requirements	0.663	0.659
		A. 8.Environmental requirements	0.875	0.873
		A. 9. Standardization	0.952	0.952
	C) Improving the HSE Management Culture (antecedents)	A. 10. Waste management	0.910	0.909
		B. 1. Establishing the competence of the system	0.849	0.847
		B. 2. System integration	0.817	0.870
		C.1. Culture Consolidation	0.787	0.785
		C.2. Attitude improvement	0.851	0.849

Integrated Management Model (HSE) with each of the following components (C1) culture consolidation and (C2) attitude improvement in sports facilities.

Structural modeling method: The first key criterion which is used in the Smart PLS software (version 3) is the coefficient of determination R<sup>2</sup> which ranges from 0 to 1 with larger values being more desirable. The obtained results are displayed in Table 5.

## Discussion

One of the results of the present study was a significant relationship between Integrated Management (HSE) and the questions of the deployment of related technologies in sports

facilities. This finding is consistent with the results of studies conducted by Golabi et al. (2016) (18), Bratchi et al. (2017) (19), Amir Haidari et al. (2017) (20), Pullen et al. (2019) (21), and Anderson et al. (2019) (22). Based on philosophical and mathematical formulation, Amir Haidari et al. (2017) presented a new framework for the assessment of HSE performance. This novel framework is based on reward and punishment policy and collects negative and positive performance elements to calculate the HSE performance index (20).

ICTs can play a significant role in managers' use of HSEs in sports facilities by facilitating the increasing role of awareness, information, and services. Therefore, it should be noted that the most HSE opportunities which are created by technology are related to managers'

perceptions and their providence (23-26). Integrated management (HSE) is a process that needs to be institutionalized in order not to lose its effectiveness, as any other social issue does (27, 28). Therefore, the creation of positions specialized for HSE in sports facilities and the work process of sports managers is another complementary component of integrated management development (HSE) in sports facilities (24).

Another result of the present study was a significant relationship between integrated management (HSE) and the questions of HSE management system deployment in sports facilities. The results of the present study are in line with those reported by Bratchi *et al.* (2017), Pullen *et al.* (2019), and Anderson *et al.* (2019). In their research, Anderson *et al.* (2019) reported that sports coaches are primarily risk managers and responsible for implementing sporting practices and policies. Although sports coaches at the university were eager to develop national standards and sport policies, they did not want an official foreign organization to regulate the operation of recreational facilities (22). Robertson *et al.* (2019) pointed out that "The Sports industry is twice as large as the auto industry and seven times as large as the US film industry" (23).

Therefore, every day more people are involved in different levels of public-recreational, educational, championship, and professional. This necessitates the development of an integrated model (HSE) in sports facilities to maintain the safety and health of athletes, spectators, referees, coaches, organizers, officials, managers, and stakeholders. In addition, it can preserve financial, material, spiritual, and human resources in this industry (24). There is a paucity of research on different forms of the integrated model (HSE) in different sports facilities and environments. Nonetheless, the present study explored the importance of the integrated model (HSE) in the creation and development of the sports industry which can create a value chain

regarding sports facilities.

The current study presented the model in three dimensions: (a) deployment of related technologies (modern antecedents), b) deployment of management systems (core components), and c) improvement of management culture (HSE). In addition, 14 domains were obtained, including 1- hardware and software improvement, 2. Legal and ethical requirements, 3. Waste management, 4. Hygiene requirements, 5. Improvement of engineering, 6. Standardization, 7. Risk management, 8. Ergonomics, 9. Environmental requirements, 10. Safety requirement, 11. Establishment of competency and qualification in the system, 12. System integration, 13. Culture consolidation, and 14. Attitude improvement). There also exist 67 measures which have been developed for the first time in the domain of sports facilities.

Another result of this study was a significant relationship between integrated management (HSE) and aspects of improvement of HSE management culture in sport areas. The results of the present study are consistent with those of Bratchi *et al.* (1396), Pollen *et al.* (2019) and Anderson *et al.* (2019). However, the results of the study by Bratchi *et al.* (1396) on introducing a combined pattern to empower risk assessment knowledge of safety, health and environment in health care systems showed that although knowledge management is an emerging process in Iran, new patterns should be implemented in all dimensions and activities in this field (19).

There exists a mutual relationship between integrated management (HSE) in sports facilities and culture. On the one hand, the results of HSE affect society, and the integrated management model (HSE) itself and the culture governing it is influenced by the culture of society. In addition, it can cause a dramatic transformation in culture (21). Furthermore, the use of HSE is a prerequisite for raising the cultural level of society with increasing productivity and improving economic conditions. Therefore, it leads to the prosperity of human beings and

society if led in the right direction (29).

On the other hand, HSE effectiveness in sports facilities requires specific methods and beliefs which are based on managers' opinions and values (18). In our country, the rich Islamic culture and the Qur'an and Imams have put considerable emphasis on acquired values rather than attributed ones. Nonetheless, there are still values in the community that undermine the ethics of applying and developing the integrated model (HSE) in sports facilities.

The improvement of HSE management culture is part of the external factors influencing the establishment of HSE in sports venues. The impact of social environment on the development of the integrated model (HSE) in sports facilities. In other words, HSE activity should be a socially acceptable practice among the members of the community. The subject of the present study regarding the sports facilities was unique; therefore, the application of the obtained results needs assessment. In other words, the performance of sports managers must be evaluated before and after using measures in the integrated model (HSE) in sports facilities.

## Conclusion

As evidenced by the obtained results, it can be concluded that the concept of the integrated model (HSE) in sports facilities can have a suitable and practical place among sport managers in three dimensions (i.e., deployment of related technologies, management system deployment, and improvement of HSE management culture). Therefore, the accurate and scientific planning and strategy for the development of the Integrated Model (HSE) in the sports facilities of the country can be identified as the greatest strength of managers in this field.

## Footnotes

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### Conflict of Interest

The authors declare no conflict of interest.

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