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Health, safety, and environmental status of Iranian school: A systematic review

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Abstract:

Schools are considered as a first community, which plays an essential role in developing the child's life skills; thus, it is important to provide safety and health in these places. Accordingly, health, safety, and environmental (HSE) issues in schools are among the important issues that should be considered. Therefore, the purpose of this study was to review the studies conducted on the HSE status of Iranian schools. A systematic search of databases, including Google Scholar, SID, PubMed, IRANDOC, MEDLIB, and Science Direct, was performed using keywords by March 2020. The reference lists of key studies were also scanned to find additional articles that are suitable to include in this study. Twenty-five studies met the inclusion criteria. The results of the studies showed that the surveyed schools had favorable status in terms of HSE indicators, and only 12% of the studies reported poor status. About 88% of schools had favorable or average condition. Some cases, such as lack of safe emergency exit and inadequate ergonomic seats, have been reported, and some differences have been observed in schools in rural and urban areas. The results showed that the health and safety situation in most of the urban schools in Iran is good and relatively favorable. However, there have also been some problems; hence, the implementation of integrated HSE management is imperative to improve the status of schools. Personal health education and safety education are also recommended.

Keywords:

Environmental, health, Iran, safety, school

Introduction

The school is the first community where the child steps in, and if its performance is based on education, it will play an important role in developing the child's life skills. Kids and teens spend half the day in school for learning and nurturing. The first social life experiences of children are provided in the school setting, and most of their subjective perceptions, assumptions, beliefs, and feedback on life are tested, measured, and experienced in school and classroom.^[1] Students are one of the most important groups at risk for accidents so that nearly half of the country's population are children and adolescents. Japan's

International Cooperation Agency has stated that disasters and accidents have severe impacts on educational services. These effects are not only due to the deaths of teachers and students but also include the sudden interruption of the education process and mental disorders of students.^[2] Among the correct and proper methods of education, favorable physical and mental environments have an important influence on the personality development of students.^[3] Studies have shown that there is a direct relationship between physical characteristics of schools and behavioral problems of students.^[4] The US reports show that 43% of mental and psychological problems and accidents in children are related to schools.

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Inadequate educational space, improper light, unsanitary and poor sanitary conditions of toilets and fountains, unsafe conditions of classrooms and school grounds, risk of fire, electrocution, and inadequate first aid facilities have been reported as the factors contributing to the decline in safety and health level in schools.^[5] In fact, one of the effective factors in maintaining and promoting the students' health and flourishing their talents is the environmental health and safety of schools.^[6] Therefore, proper safety management is always a necessity for the health of students in schools as founders of a country's future.

Safety is one of the most important issues that can be seriously addressed in the design, implementation, management, and maintenance before an accident. In today's world, the issue of safety in educational settings is of particular importance, and the analysis of existing conditions and solutions to increase safety in the urban area is on the agenda^[7] so that the importance of safety in schools in the education system is undeniable. Numerous studies have been conducted in different cities of Iran regarding the health and safety of schools.^[5] Some studies have only focused on school safety, and some have focused solely on environmental health issues. So far, no conclusions on the overall situation of the country have been reported, and only Aghili *et al.* (2010) conducted a study to evaluate the Iranian schools in terms of the establishment of health, safety, and environmental (HSE) systems.^[7] Therefore, considering the importance of HSE management in schools, this study was aimed to investigate school health and safety studies conducted in cities of Iran and to provide practical strategies for improving the health of students, teachers, and even parents and, ultimately, the whole community.

Materials and Methods

Literature search strategy

A systematic search in databases, including Google Scholar, SID, PubMed, IRANDOC, MEDLIB, and SCIENCE DIRECT, was conducted using keywords by March 2020. The reference lists of key studies were also scanned to find additional articles that could be suitable to include in the study. Health and safety outcomes were assessed with the indicators reported in the studies, including safety sense, legible design, physical safety, lighting, physical accessibility, environment, special facilities, and health safety. Other information was also collected using a questionnaire. Studies published in English or Persian and the studies conducted in Schools of Iranian cities were selected for analysis. Keywords included "Health and Environment," "Schools," "Iran," "Safety" and "HSE." Studies that examined unrelated outcomes and lacked sufficient data to analyze were excluded. The results were independently investigated

by two authors based on inclusion and exclusion criteria after removing duplicates. Data entered the final phase of analysis were extracted and analyzed.

Selection of studies

Published studies were selected for analysis if they met the following criteria:

1. It was published in English or Persian
2. Schools were the place of the study
3. Environmental health and safety indicators were reported as the results of the study
4. Field or observational studies.

Studies that examined only safety or only environmental health and other health indicators such as ergonomics, lighting, etc., lacked sufficient information to analyze and were excluded.

Extraction and synthesis of evidence

Two authors independently extracted data related to each study using the same form. The information extracted included:

1. Study features (author, year, and design)
2. Place of study (Iranian schools in all educational levels and in all cities)
3. Methods of collecting information (library, questionnaire, and observation)
4. Outcome of the study (safety, health, and environmental indicators).

Results

Flowchart of the process of identifying and retrieving studies is illustrated in Figure 1. Of a total of 85 articles (after eliminating duplicates), 25 related articles were selected, and among them, only 30 articles were full text. Finally, all 25 articles were included in the final analysis based on the inclusion and exclusion criteria. It should be noted that all of these articles have been

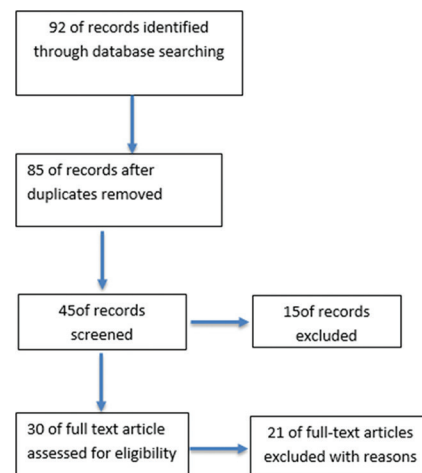


Figure 1: The process of identifying evidence

included in the study due to the limited information resources. The characteristics of the included studies are shown in Table 1.

HSE indicators evaluated in studies performed in Iranian schools included environmental health indicators, for example, class conditions, buffet, drinking water, water fountains, wastewater collection, restrooms, waste disposal and safety indicators such as heating equipment, existence and the absence of Fire Box, window protection, first aid kits, corridors, stairs, and emergency exit. Behzadkolaei *et al.* (2015)^[13] reported that HSE status was higher in private primary and secondary schools compared to public schools. However, Barjasteh *et al.*^[23] expressed that privatization does not necessarily improve health and safety indicators in primary school.

Aghili *et al.*,^[7] by conducting a study in 5 provinces (Khorasan Razavi, Bushehr, Tehran, Golestan, and Ardebil), reported that only 48.2% of pilot schools had classes with a suitable space of about 4 m³ per student in the classroom. On the other hand, only 21.4% of schools used the appropriate tables and chairs. About 69.6% of schools have no proper emergency exit for emergency use.

Moreover, Lotfollahzadeh *et al.*^[16] clarified that there is no significant difference between the health and safety status of girls' and boys' schools. In another study, Zare^[3] conducted a study for the evaluation of the health and safety status in the schools of Markazi province and showed that 25.6% of the schools surveyed had good economic conditions. Moreover, there were better situations in urban schools compared to rural schools in terms of safety, environmental health, and ergonomic indicators. Based on the results of Zazouli *et al.*,^[12] only 35.6% of buffets in urban schools and 46.6% of buffets in rural schools had a favorable condition. School environmental health indicators were relatively desirable.

Discussion

The purpose of this study was to review the safety and health of schools in the cities of Iran. The safety, health, and environmental status of schools has been examined in 25 articles. Safety status was reported to be poor in three studies and moderate and good in other studies.

In general, only 12% of the cities surveyed had poor status in terms of health and safety. About 32% reported moderate status, and 56% of them had favorable and suitable health and safety status. It is not possible to compare the results since similar review studies were not available in other countries.

The purpose of the HSE in schools is to provide a safe and healthy environment and to protect the environment. According to Zare *et al.*, only 21.2% of schools in the Markazi province were at a favorable level in terms of environmental health, and 18.1% of schools had favorable safety conditions. Moreover, 25.6% of the schools surveyed had good economic conditions.^[3] The results of the study conducted by Aghili *et al.* in schools of 5 provinces (Khorasan Razavi, Bushehr, Tehran, Golestan, and Ardabil) revealed that only 21.4% of the schools were in a favorable condition in terms of ergonomics and have used appropriate tables and chairs. However, in terms of safety, 69.6% of schools lacked a proper emergency exit.^[7] Lotfollahzadeh *et al.* showed that, in the schools of Northwestern Iran, the worst conditions were related to ergonomics of chairs and noise, while the best situation was related to the temperature and physical structure of the class, such as light, the height of classes, and blackboard.^[7,16]

Jasper *et al.* reported that increased access to hygienic toilets reduces gastrointestinal diseases and diarrhea in students of the studied schools.^[26] Zazouli *et al.* indicated that 90% of the water fountains, lavatory, and toilets in the schools of Mazandaran province had a favorable hygienic condition. Safety status, sewage disposal, and waste disposal have also been reported to be favorable.^[12] Ulukanligil and Seyrek studied the health status of suburban schools in Turkey and observed that the number of tap water was limited; the hygiene of the toilets was poor; there was no soap, and solid waste was dumped around these schools, which was led to the prevalence of parasitic diseases among the population of these schools.^[27]

Samwel and Gabizon showed that the use of sanitary toilets would prevent groundwater pollution.^[28] Sarmadi *et al.* also recommended the necessity of connecting the sewage collection system of school to the sewage collection network.^[5]

In some of the articles reviewed in this study, the health and safety status of public and non-public schools has also been compared, and differences have sometimes been observed. So that Behzadkolaei *et al.* observed that safety, health, and environment status was better in nonpublic schools compared to public schools and expressed that the reason for higher HSE rating in private primary schools compared to public schools was the manager's awareness and implementation of recommended HSE standards.^[13] However, Khalili *et al.* remarked that all private schools and 95% of public schools of Qazvin had poor health and safety status.^[22] Furthermore, according to Barjasteh *et al.*, privatization does not necessarily improve the primary health and safety indicators.^[23]

Table 1: Table of list of study

Row	Study	Years	Region	Design	Study method	Outcomes examined	Key findings
1	Fadaei ^[8]	2013	Shahre- Kord	Cross-sectional	Check list	Environmental health and safety	Safety status was reported appropriate and relatively good
2	Zare ^[3]	2003-2004	Markazi Province	Descriptive Cross-sectional	Check list	Environmental health and safety and ergonomic	The health and safety status of the schools was reported Undesirable
3	Akhound Noghani ^[9]	2017	Mashhad	Descriptive Cross-sectional	Check list	Environmental health and safety	Health and safety status was evaluated desirable
4	Balarak ^[10]	2014	Zahedan	Descriptive Cross-sectional	School environment health assessment form	Environmental health and safety	The health and safety status of the schools was reported. Undesirable
5	Mirzaei ^[11]	2013	Ilam	Cross-sectional	Check list	Environmental health and safety	School status safety and health was reported moderate
6	Zazouli ^[12]	2012	Mazandaran Province	Cross-sectional	Check list	Environmental health and safety	Status of environmental health and safety were favorable
7	Sarmadi ^[5]	2016-2017	Torbat heydarieh	Cross-sectional	Check list and observation interview	Environmental health and safety	Status of safety, health and Environmental was reported medium AND desirable
8	Asadi Behzakolaei ^[13]	2015	Sari	Descriptive Cross-sectional	Standard questionnaire, direct interview	Health, safety and environment	Conditions of health and safety and the environment was higher in nongovernment and private schools
9	Abolli ^[14]	2015	Gharmsar	Descriptive Cross-sectional	Check list	Environmental health and safety	Health and safety in schools have been relatively favorable
10	Ranjbar Wakilabadi ^[15]	2011	Bushehr	Descriptive	Check list and direct observation interview	Environmental health and safety	Environmental health status was more favorable in modern schools and safety and health status of urban schools was reported to be more suitable than village
11	Moslemi aghili ^[7]	2006-2007	five provinces (Khorasan Razavi, Bushehr, Ardabil, Golestan, Tehran)	Cross-sectional	Researcher-made checklist based on ministry of health regulations	Health, safety and environment	After the establishment of the HSE management system in the pilot schools, health promotion was observed
12	Lotfollahzadeh ^[16]	2015	North West (Ardail)	Descriptive	Standard questionnaire with direct interview	Health, safety and environment	Finally only 18% of primary schools, 25% of guidance school and 71% of high schools were excellent in total health safety and environment standards. The rest were average
13	Mousvi ^[17]	2012-2013	Paveh	Descriptive Cross-sectional	Direct observation Complete the HSE checklist	Environmental health and safety	More than 70% of schools have reported desirable health and safety
14	Aghalari ^[18]	2015	Babol	Descriptive Cross-sectional	Check list observation	Environmental health and safety	In most of schools have reported desirable health and safety status
15	Shokri ^[19]	2016	Abadan	Descriptive Cross-sectional	Check list	Environmental health and safety	Most schools reported good health and safety status. Buffet schools were in poor health
16	Neshat ^[20]	2010	Zabol	Analytical Cross-sectional	School environment health assessment form	Environmental health and safety	49% of schools had good environmental health and 63% had good safety status
17	Malakootian ^[21]	2007	Kerman	Descriptive Cross-sectional	Check list Observation and interview	Environmental health and safety	80% of the schools had a desirable environmental and health status

Contd...

Table 1: Contd...

Row	Study	Years	Region	Design	Study method	Outcomes examined	Key findings
18	Khalili ^[22]	2001	Ghazvin	Cross-sectional	Questionnaire Interview, observation and measurement of variables related to health and safety	Environmental health and safety	.All private schools and 95% public school had an undesirable situation in terms of health and safety.
19	Barjasteh Askari ^[23]	2015-2016	Kashmar	Descriptive Cross-sectional	Standard checklist interview, observation and inspection	Environmental health and safety	The status of safety and health was relatively favorable
20	Saeedi ^[24]	2017	Izeh	Descriptive	Questionnaire Interview, observation	Environmental health and safety	The environmental health and safety of schools in is moderate
21	Ali Arabian ^[25]	2014	Nahavand	Descriptive Cross-sectional	Standard check list Observation	Health, safety and environment	Most schools had good HSE status.

HSE: Health, safety, and environmental

Small towns, including Nahavand, Babol, Zabol, Shahr-e-Kord, and Abadan, are among the cities that have reported favorable and suitable conditions. Nevertheless, the results of studies have revealed a significant difference between urban and rural areas. Zare also found better conditions in urban schools than in rural schools in terms of safety, environmental health, and ergonomic indicators.^[3] The study conducted by Ranjbar *et al.* in Bushehr showed that new schools had favorable conditions, and urban schools were more desirable in terms of safety, health, and environment than rural schools.^[15] However, Zazouli *et al.* examined the schools of all different levels in the urban and rural areas of Mazandaran province in terms of safety and environmental health. They indicated that there were no significant differences in rural and urban schools, and even the rural schools had more favorable status in some indicators such as safety and health status and sewage disposal.^[12]

Results of Samwel and Gabizon show that school health in rural areas was in poor condition in some countries, such as Romania, Moldova, Armenia, Ukraine, or Uzbekistan, which recently joined the European Union.^[28]

In Iranian studies, the HSE indices in girls' and boys' schools have also been compared. According to Zare, there was a significant difference in safety, health, and ergonomic indices in girls' and boys' schools^[3] while there were no significant differences in the studies conducted by Lotfollahzadeh *et al.* and Behzadkolaee *et al.*^[7,13,16]

School buffet is important as a distribution unit of snacks and food for students and has studied in some health studies. The results of the study conducted by Zazouli *et al.* showed that only 35.6% of the urban school buffet and 46.6% of the province school buffet had health status. Considering the environmental health role of healthy

food distribution centers in maintaining student health, the follow-up has been recommended to address these buffet shortcomings.^[12]

Existing articles have mainly focused on the subjects of environmental health and safety of the schools; in these articles, all environmental aspects have not been addressed, but only environmental health has been discussed. In addition, occupational health issues have not been assessed. In schools, like any other workplace, there are employees, including teachers, administrators, janitors, etc., and there are occupational hazards that affect their health. This issue needs to be addressed in future studies. Schools with lower HSE ratings need to be aware of the guidelines and infrastructures required to improve their HSE ratings. Studies of Aghili *et al.* in schools of 5 provinces (Khorasan Razavi, Bushehr, Tehran, Golestan, and Ardebil) have demonstrated that the establishment of an HSE management system in schools in these provinces has improved their safety, health, and environmental status.^[7]

Conclusion

The purpose of HSE in schools is to protect students, teachers, and to protect the environment. The findings of this study showed that the safety and health status in most of the schools in Iran are in good and relatively favorable conditions. However, some studies reported the ergonomic problems related to tables and chairs and lack of safe emergency exit and hygiene buffet. Therefore, to improve the status of schools, implementation of integrated safety, health, and environmental management are essential for schools; therefore, providing personal hygiene training and safety education to students and teachers and connecting the sewage collection network to municipal sewage collection protect the environment is strongly recommended. It is recommended to evaluate

occupational health in schools to provide an always safe and healthy environment for all users, both students and teachers.

Recommendations

Measures needed to improve the safety, health, and environmental status are listed as follows:

- Providing lighting systems and adequate light in schools in accordance with the standard
- Providing and enhancing safety features such as safety capsules, first aid kits and shields for power cables and secure emergency exit
- Improving the ergonomics status by designing and manufacturing school equipment, including chairs according to national standards and the necessity to develop native standards
- Improving school building safety by the latest standards
- Appropriate measures to reduce noise pollution in schools
- Creating a buffet according to health indicators
- Identifying the harmful factors (chemical, physical, biological, and psychological) and minimizing them
- Increasing health indicators in the toilets, water fountain, school buffet, and trash
- Connecting the school sewage collection system to the municipal sewage collection network.

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Conflicts of interest

There are no conflicts of interest.

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