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# Investigation of effective factors on safety management in educational-training organizations of metropolises

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**Abstract**

Educational centers are of those types of organizations to which almost everyone refer during the life to use the services. Accordingly, the suitability of safety situation in these organizations is of high importance. The present study aims at investigation of effective factors on safety management in educational-training organizations of metropolises. This study is an applied descriptive research. The educational centers of metropolises comprised the statistical population of the current study, and Tehran is the selected sample as Iran's capital and a metropolis. The collected data examined the safety discussions in terms of human factors, management error, equipment and environmental factors. The results of the study indicated that the identified factors (human, management error, equipment, and environmental factors) affect the safety management, and the factors of management errors, human factors, environmental elements, and equipment were of highest to least importance, respectively.

**Key words:** *safety management, human error, management error, environmental factors, and equipment, educational centers of metropolises.*

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## 1.Introduction

The contemporary world is a competitive climate. The competition gets intense by rapid technological developments, changes of consumption patterns and market needs, high social expectations and social responsibilities of organizations. The survival in these conditions depends on competitive advantages of organizations. Realization of organizational purposes in competitiveness has made dealing with hygiene and safety a priority for today organizations. As long as a manager is not himself a pioneer in hygiene, protection, and safety, other administrators and authorities cannot achieve fruitfull results. Manpower in every country, the developing countries in particular, is considered a significant part of the national capital and one of the pillars of socio-economic developments. Therefore, protection of human health and improvement of the working environment are of great importance. It is not possible, in fact, to have a prosperous and dynamic society without a healthy man power (Hosseini, 2013: 83). Some scholars believe that a precise appraisal of safety environment may be effective in identification and assessment of potential problems of the environment, increase of work efficiency of employees, and reduction of the rate of accidents. A standard safety environment, actually, could affect the safe behavior of people and keep accidents at bay (Wadsworth et al., 2003).

According to the latest statistics on accidents in Iran, the main cause of these events has been carelessness and unsafe acts. Thus, a significant way of reducing accidents is control of unsafe behaviors among people which could be realized though optimization of safety culture (Fam, M., 2006). One of the optimization ways of safety culture is teaching safety notes that is included in responsibilities of educational centers around the world. In the event of safety management weakness in the aforementioned centers that are responsible for education in diverse levels and subject fields, the nature and purpose of these entities goes problematic. Safety culture is a concept which refers to describing the safety management method within work setting and often reflects attitudes, beliefs, perceptions, and values that are common among people on interpersonal safety (Aminpour et al., 2011). Identification of safety culture importance in prevention of occupational accidents indicates the very attempts in order to identify and investigate the safety culture in organizations. There is not a collective unanimity on safety culture definition in different organizations. This, thus, is a multifaceted concept without a clear, definite and explicit structure (Fernandez et al., 2007). accidents, errors and human lapses are of industrial revolutions consequences. A little carelessness or inattention may bring about an awful accident. These inattentions claim some lives and cause casualties and property damages to the organization. The mass media broadcasts everyday news of the abovementioned incidents which come from inattention and ignoring safety principles (Rahmani & Derafshi, 2009: 57-58).

The manpower which plays a direct role in accidents is what we witness widely in educational centers, especially elementary schools. The personnel, parents, managers etc. affect it and could be given attentions as beneficieries as far as the safety management is concerned. This role is more important in Metropolises like Tehran.

The present study attempts to answer the following questions, given the importance of human health, environmental safety, and the effective factors on safety management of educational environments such as schools:

1.Do human factors affect the safety management of educational environments?

2.Do management errors affect the safety management of educational environments?

3.Do environmental factors affect the safety management of educational environments?

4.Does equipment affect the safety management of educational environments?



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## 2.Theoretical Fundamentals of Research

Safety means protection of people against the damages coming from accidents. These factors are of high importance, because an environment of higher health and safety would present more efficiency and effectiveness as well. The prospective managers, accordingly, support plans on improving hygiene and safety. Today, on account of legal requirements, all organizations are obliged to observe the hygiene and safety of employees, customers and their work settings (Namazi & Sadeghifard, 2005).

The concept of safety culture comes from a report in 1986 on Chernobyl disaster. An event in which errors and slaps of the used operational method indicated the weak safety culture in the plant at the time of the incident (Lee et al., 2014). Today, it is believed that most of incidents are created by errors and inattentions of people. It goes without saying that an appropriate safety culture development causes at first a reform in individual behaviors leading finally to a reduction in human errors and accidents. Optimization of safety culture among people is one of the significant ways of reducing occupational incidents. Definitely there is a direct relationship between safety culture and different industrial accidents and the consequences (Halvani & Ebrahimzadeh, 2012).

Human error is a factor affecting the occupational safety. Human error, carelessness of individuals, deficient and unsafe equipment, lack of suitable air conditioning for exhaust of smoke especially in indoor workplaces, and untrained people in using equipment or at the time of facing with incidents in organizations (Ranjvar & Mo'azeni, 2010: 12)

There is some statistics report about some accidents in Iran that omitted . Also, prolongation of work hours for personnel given the commuting time and wandering of staff after their posts, early work hours, lack of precise schedule for post change, lack of a convenient place to take a rest for the employees whom the work hours are ended, duress of authoritarian superiors for keep going with the work and their unpleasant behaviors with those personnel who complain of exhaust are of factors of error of human manpower (Hamze'ei & Malekian, 2006). The aforementioned points are the data which is obtained from industrial centers. Most of the abovementioned subjects are true for educational centers and affect highly the quality of affairs.

The management error is another factor that affects the occupational safety. Error may happen more if managers are not aware of their roles in conducting affairs. Some incidents happen due to management errors. The management controlling activities as workflow, or in other words, intermittent transfer of those people who are in charge of certain responsibilities may be presented to reduce the threats via right and timely management decisions. The managers should influence effectively on all employees as well as the working environment and identify well the safety factors of environment which decrease the incidents, and apply their authority and attempts in keeping people safe and healthy (Hosseini, 2011:89).

In this connection, some cases could be discussed here such as making the building safe (the educational center), the required safety equipment and training by the manager in micro and macro levels. For example, lack of sufficient governmental supervision and unnoticed construction standards caused a school in Haiti to demolish and claimed lives of 92 students. The manager of this school went under arrest as well on unobserved supervision (Tabnak news site, 2008). The ruin of two ceilings in a school in the historical district of Yazd due to rain and no repair for years is another reported accident which did not claim any lives because the students attended at the morning ceremony (Mehr News Agency, 2008). The fault of Ministry of Education and Organization for Renovating, Developing and Equipping Schools in management and repair of old schools are of causes of these incidents which have been given attentions



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in next years and led to holding the Second Safe Schools Summit in October of 2015 in Tehran. According to this, it is scheduled for participants of 23 countries and 9 international entities to visit a number of retrofitted and rebuilt schools and get familiar more with Iranian measurements in boosting safety for schools. Three fundamental elements of meeting safety equipment, teaching of safety issues to students and others in schools, and crisis management are going to be proposed in the aforementioned conference and operational measurements of countries on safety of schools are scheduled to be discussed. Iran is going to provide other states with its technical and advisory services as well as the relevant experiences on localization of schools safety knowhow (Tasnim News Agency, 2015). This would produce significant developments in safety management of educational centers and schools and make managers to benefit from each other's experiences in optimization of safety level. Definitely, numerous educational centers in metropolises need more planning, organizing, conduct, control, and supervision compared to smaller cities and this makes this responsibility more difficult.

Another factor which affects the safety of work is the environmental element. Safety as an indicator of a relative degree of scaping from threat, and professional hygiene are the concepts for assessment of encountering threats and should be observed by managers of educational centers. It goes without saying that identification and control of threats for increasing efficiency (as an efficiency set of the organization) are possible through a healthy and safe setting and personnel. Since sometimes it is not possible to control a major part of harmful factors (such as the environment out of the school), the only solution would be training of people on individual protection and most of environmental standardization. In some cases of course, being exposed to chemicals and the consequences (like working in the laboratories of schools) could highly threaten the health the employees and even others (such as learners). Therefore, in order to protection of human resources and increase of work efficiency, identification and control of above threats is of high significance. The aforementioned responsibilities in today safety culture are not only human acts in line with socio-economic purposes, they are considered, but, a legal duty as well (Alavi & Jannatifard, 2009).

There could be added other harmful environmental factors to above cases such as educational centers in crowded noisy places, or polluted places that could bring about stress and mental disorders for people (the managerial and executive authorities as well as learners). When each of the aforementioned factors exceeds the human physiological tolerance, it would cause hurts and losses. The major attempts in professional hygiene are made to assess these factors and control or remove them (Kermani, 2011).

One of the main indicators of safety and professional hygiene is increase of efficiency in educational units. Property damages and casualties, however, are adverse aftermaths of all educational incidents. Accidents, thus, may produce human irreparable losses. All these affect evidently the efficiency of educational units. In addition to the above factors, the relevant diseases influence the efficiency directly and indirectly; because further to economic losses coming from medical treatment expenses, insurance and other related costs, the remoteness of people from educational setting is very important as well. By reducing of incidents, the probability of damages to the equipment and financial losses would decrease which would make the number of casualties to drop. For example, in a fire in a school in Shinabad village in Piranshahr in November of 2012 due to deficiencies in heating equipments, 29 schoolgirls were burned of which two were died due to severe injuries. Fingers of three students were cut due to intensified burned and failure of transplantation. More-



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over, this created serious socio-mental trauma for students, their family members and the educational society of the country. This is only one sample out of numerous similar events in this connection, and referring to news and evidences would unveil the depth of the story and indicates the importance of safety management in educational environments.

The followings are advantages of observing safety and professional hygiene principles (Fam, M., 2009:303).

For individuals (personnels, instructors, learners, and their families): 1. confidence increase, 2. work pressure decrease, 3. losses and injuries drop, 4. accidents reduction, 5. rise of convenience, 6. welfare and health improvement, and 7. hygiene increase in working environment;

For employer: 1. accidents reduction, 2. quality optimization, 3. efficiency increase of personnel, 4. error reduction, 5. decrease of medical treatment expenses of dependents, 6. efficient use of human capital.

Chapter four of the executive regulations of schools deals with the hygiene and safety conditions of schools which requires schools to provide the first aid equipment and therapeutic and health cares as well as fire extinguishing facilities in all places of schools such as library, gym, assembly hall, laboratory and the prayer room. Accident insurance cover is another important matter which managers should observe for students to benefit from at the time of accidents (for any reason). The aforementioned regulation has pointed out to providing officials of educational centers with required trainings and making learners informed of safety services in order to reduce damages to a minimum amount (Education High Council Secretariat, 2000).

The equipment, associated with the matter of environment, is important and discussed much in terms of safety. When it comes to standard schools, issues like design, location, and other features are studied, such as the facts that schools should be away from crowded and noisy places like rails, terminals, and workshops. Commuting to schools should be done easily and this is critical for crowded streets (near the mentioned places) at particular times of a day.

**3.Literature**

Paying attention to employees' health, improving welfare situation, adapting work condition with physical and mental situation are taken today as duties and not as advantages. The more health of people is observed, the more efficiency on development trend of organizations and communities would be achieved. Evidences of examining the importance of safety management system in increase of hygiene and safety level of industrial sectors indicate that 46% of occupational accidents that lead to disability have come from an organizational cause. According to the former studies, 50% of occupational accidents happen by lack of an efficient safety management system (Lafuente E, (Vilajosana,2013:47). Lindroos & Burstroom (2010) showed in their research that men are exposed to industrial injuries more than women and this suggests higher attendance of men in industries than women. Possessing wide coverage and high number of employees, the construction industry accounts for 57.5% of the accidents. Among causes of industrial accidents are different hygiene risks, lack of perfect observance of work safety, lack of compliance with regulations and instructions, worn-out and inadequate equipment, manpower with low education, human error, and pressure for completion of work project. Since most industries belong to private sector, and most of things in construction industry are done manually, hands suffer from injuries more than other parts of the body. However, Lina.et al. (2008) believed being young and inexperienced as a reason of increasing risk of fatal accidents. Young people have less experience, ability to identify threats, and received educations compared to elder ones; thus, they exposed to more vulnerability. On the other hand, many employers are interested in using



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young people due to their youth power and less payment. This causes the novices to be not informed well about the work threats because of unfamiliarity with the workplace and they would, accordingly, face with insufficient trainings and lack of a safe workplace. These may happen more in workshops and private industries because they may not be under supervision of Ministry of Cooperatives, Labour, and Social Welfare, and may employ workforce illegally. Hofmann & Stetzer (2013) reported the conclusion that unsafe behaviors highly affect accidents in a way that most of scholars know unsafe behaviors as the key factor in more than 70% of accidents. Also according to Guldenmund (2012), spread of safety culture with the purpose of attitude change of people to observe fully the safety principles including correct use of personal protective equipment influences significantly decrease of unsafe behaviors (59).

There are some studies carried out in this country as well on safety management. In a research titled "investigation of perception of employees to safety culture in Copper Semimanufactured Products Co. (CSP) using the Health Belief Model (HBM), Zali, (2013) found out that the staff under study enjoyed a relatively good attitude to safety. Since employers are considered a vulnerable group in workplace, it is advisable to run educational and interferential programs using the Health Belief Model or other educational modes aiming at increase of their perceptions on observing the safety principles (82). In a research titled "design and presentation of a specialized questionnaire on safety culture based on a local model in the Iranian automotive industry", Touri (2013) demonstrated that there was not any specialized tool for evaluation of safety culture in line with a local model. The results of the present study revealed that evaluation of safety culture using the designed questionnaire in this industry is valid (84). In a research titled "investigation of safety in a petrochemical industry in Petrochemical Special Economic Zone (PETZONE), Shokouhi (2012) found out in 2010 that individual variables such as age, education and experience do not affect much the safety level. In fact, it is the ruling management in workplace that constitutes the organizational setting as well as ruling safety climate in the work environment. This corroborates again the obligation principle of senior managers concerning safety and its role in prevention of accidents. Therefore, the safety condition is regarded as a suitable indicator for performance evaluation of safety management system and professional hygiene (85).

There are researches available on safety situation in schools. Although there is a shortage of sufficient studies in this connection, the existing figures and statistics indicate certain problems in these educational environments. In a research on investigation of safety situation in schools, Ghorbanpour, Nouri, Kor, Dadipour, Cherabin, and Adib (2009) remarked based on their findings to inconvenient location of over 60% of established schools. They reported that 56.9% of the schools under study had safe stairs and only 21.6% possessed emergency exit. More than 71% of schools were in short of perfect first aid equipment as well. They concluded that the unsatisfactory safey condition in the population under study was fallen far behind the hygiene and safety standards of schools.

In an another research on investigation of safety conditions of elementary schools in Mazandaran province based on relevant standards which was carried out by Javadian Koutenaei, Yousefi, and Asadpour in 2010, safety in schools – and the related problems coming from low level of safety- was gone through as a serious challenge for education. There were witnessed old classes, unsafe ceilings, and nonstandard electrical installations. The results of this research unveiled standard location of only 25% of schools and standard electrical installations for 50.3%, although over 97% of schools were enjoyed standard first aid equipment. The aforementioned study



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concluded that the safety situation of schools in Mazandaran – in certain cases such as location- is far behind standards, and this requires a sufficient allocated budget by Ministry of Education aiming at optimization of safety as well as reconstruction of old schools.

**4.Research methodology, Statistical Population and Sample**

The present study is an applied – in terms of purpose – and descriptive – in terms of type and method- research. This study attempted to present facts and notes analytically. Therefore, based on the evidences approved by scholars, the researcher has made attempts to investigate the effective factors in safety of educational entities in metropolises, and offer suggestions on optimization of safety in these centers. The statistical population of this study was all educational entities out of which the training-educational centers of metropolises were examined as samples.

**5.Results**

In order to reach answers to the proposed questions in this study, the importance of the matter as well as its effective factors are sought and discussed here from evidences and approvals ruling over society and the Ministry of Education. Institute of Standard and Industrial Research of Iran (ISIRI) has approved and emphasized the hygiene standards of schools. These standards are set to apply regulations and plans on protection, meet, and improvement of physical and mental health as well as increase of learning and educational efficiency in schools in order to make students benefit from traning and educational programs in a healthy social environment (ISIRI, 2002). It is worth noting that the regulation of environment hygiene in schools was approved by the Ministry of Education within the same year. The National Curriculum Document has discussed and stressed observance of hygiene and safety of individuals and environments in work settings as required competencies of the workforce. This has been mentioned in learning area statements (Ministry of Education, 2010).

Adaptation of physical setting of schools, optimization of policies and plans and public education system of schools (including ones abroad) as well as employment of committed, qualified and experienced staff have been stressed in Education Fundamental Reformation Document (Ministry of Education, 2011).

**Tackling first question:** Do human factors affect the safety management of educational environments?

The emphasis on perception of people of protection of health, optimization of their attitudes and beliefs – on prevention of and keeping accidents at bay, and learning to keep accidents in check- comes from influence of human factors on safety management of educational environments. Accordingly, education of manpower in all organizations including educational entities is of high significance and managers and staff accept to make even high payments on this issue. The results of statistics and researches mark the effect of human factors on occurrence of accidents and unsafety of environments. The Second international Safe Schools Summit in October of 2015 in Tehran corroborated the abovementioned matter in a way that one of the key issues in this conference was education of students and officials of schools on safety (news website of Ministry of Education, October, 2015).

**Tackling Second question:** Do management errors affect the safety management of educational environments?

Being aware of error occurrence in educational entities make the managers to intensify their managerial control to prevent errors and minimize them. These measurements are observable also in decisions of senior governmental officials including the Ministry of Education. Crisis management plays an important role in safe schools. Decisions and policies of top executives of the country led to pass the rule of demolition, reconstruction and retrofitting of schools and allocation of over 4 billion USD.



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According to the latest published statistics at the time of carrying out of this research, more than 4.8 billion USD has been spent on increase of safety of schools. Over 66,000 classes are under study to be retrofitted out of which 29,000 are under retrofitting (ISNA News Agency, 2015). The abovementioned are a part of managerial attention to safety of educational environments. Unnoticed managerial duties in macro scale could bring about irreparable losses to educational settings.

**Tackling third question:** Do environmental factors affect the safety management of educational environments?

Existence of educational centers could change occurrence of accidents in the respective area. Enjoying safe drinking water, and being located in humid environments may affect highly threats against health of people. The environmental conditions are also influencial in personal and environmental hygiene and make its observance important in and out of these entities. A relaxed environment away from mental disorders and stresses of noisy places are given attentions in training and educational centers and could be considered given the restricted area of metropolises.

**Tackling fourth question:** Does equipment affect the safety management of educational environments?

The role of equipment in making entities safe is evident. The released statistics indicate the fact that education of how to use the equipment, the required concentration in using the equipment, time and amount of using the equipment, etc. are effective in safety decrease or increase. It is evident that equipment safety is associated directly with human errors and the fatigue-driven error or insufficient mastery over equipments may cause accidents. Fortunately, working with industrial and intricate stuff is not performed widely in schools; however, the material and equipment used in laboratories and workshops could affect safety of the educational center. Another matter associated with educational equipment is heating and cooling utilities in classes of which the news of relevant numerous accidents recollects the managers and other authorities of paying attention to this issue.

**6. Ranking of Elements**

To investigate the importance and ranking of efficiency of key elements under discussion, the former researches were referred and related data on every element were examined. The statistics of accidents in researches and the media could be a basis for ranking of these elements among which the managerial errors – referred as human error in some cases- are more prominent. The aforementioned elements are investigated in a research by S. Poursalim (2014) on loading and unloading platforms of oil depot in Lorestan province, and ranked using the Friedman test. The achieved results of this ranking show that management errors were of highest importance which are followed by human factors, environmental factors, and finally the equipment as next elements with least importance, respectively.

**7. Discusition and Conclusion**

According to above findings, the efficiency increase of safety management is in need of an integrated approach and interactions at levels of individual and organization. Therefore, at individual or human level, the appropriate attitude to safety, willingness to learning, interpersonal friendship relationships at any level cause safety level of the system to improve. On the other hand, supporting of safety performance, setting the stage for safety learning and educational continuous optimization, development of safety infrastructure, development of safety culture through imposing of rules and procedures consistent with work requirements of the organization, giving importance to safety, holding of consultation meetings on safety (such as the Safe Schools Summit) and cooperative system of staff, making the matter of safety prioritized in organizational strategies and managerial decisions would bring in optimization of organizational level in safety management improvement. Through setting



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of safety objectives and ranking them, thus, a comprehensive planning to use the organization's potential should be accomplished based on which the safety strategy of the organization is determined. The evaluation and supervision on safety measurements and constant watch of the system should be implemented via a method consistent with the organizational structure. The current study is focused on investigation of human factors, management errors, environmental factors and equipments in educational environments among which certain social factors, out of control of school's officials, could be mentioned, including the accidents related to commuting to educational entities or those incidents that may happen during sport exercises. However, identification of effective factors and their ranking could contribute the hygiene and safety planners, managers, and experts in long-term decision makings and prioritizing of educational centers and provide a more precise identification on safety of educational entities specially the schools of metropolises.

**8. Suggestions**

As Islamic Consultative Assembly has pointed out the necessity of making schools safe as a very serious matter and allocated a budget of 350 million USD for this (ANA News Agency, 2015), all people involved in education are required to pay attention to safety improvement of educational environments and perform their human and managerial duties aptly. Also, the confident and executive ways of making educational entities safe should be regarded by managers and prioritization should be held; as approved in the Safe Schools Summit that the roadmap of executive plans of countries is investigated and global decisions are made (ANA News Agency, 2015). Since the issues and findings of the aforementioned summit are going to be released as an international document, the provisions should be binding and notified to all training and educational centers.

Given certain accidents which threaten safety of schools are evident (including nonstandard heating and cooling utilities), these should be prioritized by managers to tackle with to prevent potential later accidents and minimize probable damages and concerns of families. Employing safety management methods, setting safety standards and procedures considering the architecture of buildings and commuting to work in metropolises (especially when, in emergency, relief vehicles are trapped in the urban traffic jam) could affect positively the safety improvement of educational entities and minimize the threats. Implementation of the above mentioned issues requires definitely comprehensive support of all involved organizations as well as setting executive and transparent rules.

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