

Prevention and Safety Training to Improve Community Health

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Abstract

Background and Purpose:

Public health problems are caused by the emergence of environmental pollution and infectious diseases, which have caused concern around the world. The public health threat affects the relationship between people. Population growth and associated pressures increase difficulties associated with effective means of maintaining public health. The diseases transmitted from human and livestock communication, water pollution, air pollution, and environmental pollutants urge us to find new

solutions to address these problems. Understanding the environmental and environmental health is a prerequisite for protecting public health. In Iran, like other countries in the world, the issue of environmental protection and its compliance with the first program of economic, social and cultural development of the Islamic Republic has begun and expanded in the future. In this regard, new perspectives are being introduced that will bring about dramatic changes at various levels of planning, processes and specialized sectors such as civil, industrial and educational sectors. The training of engineers in this regard can play a very important role in refining the attitudes of young engineers and using these bases in their specialized activities. One of the important tasks of universities is to provide a suitable platform for such training. In this regard, it is essential that the major industrial universities of the country develop various programs in this field.

Materials and Methods: The present study is a review of the type of validity that is performed through search of authoritative scientific databases such as PubMed and Scopus, Google scholar, PubMed using the key words of building safety and health, HSE, and prevention methods are the latest information.

Results: Implementing the principles of HSE in vari-

ous construction, industrial and other projects requires time, because any change that is considered in the system requires a change of attitude, which in turn requires time to adapt and adapt to the new conditions. The conditions for the projects in this research are their current conditions, and the next research, after a while, can determine the percentage of project progress in terms of HSE.

Conclusion: In order to comply with the principle of HSE cases, there is a need for training. These trainings should be executed at different levels and levels of contracting and monitoring so that the level of awareness of the risks involved in the development of civil operations between the personnel reaches a common frontier.

Introduction

Remember, accidents and incidents are the most important cause of preventable childhood deaths in our country and our province. Everyone likes to live with safety and comfort, but events are always on the watch. Children under 6 are experiencing an accident due to lack of awareness around, not knowing about the risks and the inability to escape from their dangerous or dangerous position. Therefore, we are the adults and caregivers of children who should not let us suffer from the carelessness or carelessness of our children, whose consequences, the pain, the suffering and disability of the children. Small and simple events are part of the world of children not only important but informative. But what has to be prevented is serious accidents that cause serious injury and even harrowing deaths. Accidents and incidents of the fifth cause of death in the world are the major causes of deaths in hospitals as well as the main cause of death at the age of 1 to 18. The maximum number of deaths due to drowning accidents is the closure of breathing paths with solid chemicals, burning with hot materials and accidental poisoning of substances or drugs, falling from the height of suffocation due to gas and fumes of reptiles and toxic plants and plants. The number of road accidents in Iran is 20 times the global

average. Every year in Iran, road accidents kill about 28,000 men and injured more than 300,000.[1-2]. In this regard, new perspectives are being introduced that will bring about dramatic changes at various levels of planning, processes and specialized sectors such as civil, industrial and educational sectors. The training of engineers in this regard can play a very important role in refining the attitudes of young engineers and using these bases in their specialized activities. One of the important tasks of universities is to provide a suitable platform for such training. In this regard, it is essential that the major industrial universities of the country develop various programs in this field [3-4].

The HSE management system is a management tool for controlling and improving health, safety, environmental and quality issues. This management system, by simultaneously examining the three factors, provides a good basis for the establishment and implementation of environmental management standards (ISO14000), Occupational Safety and Health Management (OHSAS18001) standards. According to researches carried out in this field, attention to the principles of occupational safety and health and observance of these principles has played a major role in reducing the economic losses of industrial units. Because with the reduction of accidents, the possibility of damage to the equipment and the loss of financial losses and the reduction of personal injury will occur. The incidence of any incident even includes very small losses that are classified as either direct or indirect losses or indirect or hidden losses [5-7].

According to the definition, "the incident" is an unexpected and unpleasant event that has interrupted work activities and may also be associated with injury or financial loss. some incidents result in serious damages and damages to human, social and industrial damages which will have a significant impact on productivity and productivity through reduction of work efficiency, and

more importantly, the effects of social abuse and consequently psychological effects on the workforce.

In any case, the safety techniques have shown that we can control events and prevent them from occurring. The successful prevention of the incident has at least four fundamental actions: 1 - Study and comprehensive study of the work environment 2 - Analysis of incidents (3) monitoring and monitoring of accidents. 3 - Training efforts are continuing to provide additional clarification in each case.

Risk Assessment

In order to assess occupational hazards, the estimation of the quantitative and qualitative features of risk in the work environment and the purpose of this work is to reduce accidents and occupational diseases. Following the identification of the risks involved in the workplace, the risk assessment begins, which includes the following steps. Some of the workers are at greater risk, including:

(a) Young workers, new workers, apprentices, students b - cleaner workers, clients, contractors, maintenance workers and generally people who are not constantly in the workplace are subject to more accidents because of their perceptions of the workplace and its risks.

Measures to Assess the Precautions and Precautions Available:

At this stage, we should consider how any risk may cause injury. This will make it clear to us whether to take more radical measures to mitigate the risk. We also need to determine how far the risks remain after the precautions are taken.

Training: Observing safety and the overall HSE requirements at the level of projects, whether developed or industrialized by a culture, and until a person reaches cultural growth, it will be very difficult to achieve this goal. For a culture-oriented culture, first, education should be included in the programs, and then this culture is injected into different classes in the form of beliefs and

principles. Given the importance of training in the HSE culture, it is necessary to provide training at the level of project managers, workshop supervisors and HSE project managers. After training key personnel and realizing the organization's goals for creating a HSE culture at senior management levels, training all staff can also be done after these individuals at the project level. By publishing educational pamphlets in the form of instructions, checklist, videos and educational clips, the HSE position is strengthened and, ultimately, by monitoring the supervisors, it can be institutionalized [8-10].

In this research, development projects were considered, which included the construction of tunnels, highways, bridges and underpasses. There are various activities in terms of safety, health and environment in these projects that are mentioned below:

The commencement of construction work will be carried out only after the construction permit is issued, which includes installing and installing structural members, concrete structures and other measures, as detailed in the 12th National Building Code[11-12]. Meanwhile, the owner, owners and stakeholders as well as contractors and mass makers are required to take the following actions in order to maintain and ensure public safety:

it is obvious that in order to prevent accidents, without organizing and organizing necessary action, there is no need for a dramatic action, and any proper organizing will require investigation and research for appropriate planning. therefore, one of the most important steps in planning prevention is investigating accidents and incidents. Research and accident prevention shows that part of the preparation programs for dealing with accidents and incidents, having adequate knowledge and information about the circumstances of the emergence of accidents and the ways of dealing with them. Awareness and lessons of the consequences of bitter events should lead to proper response in order to eliminate them. If action is not taken to prevent future accidents of the future, incidents involving a poor

physical and material loss are observed to be insignificant, so immediately after each incident, the immediate attention has to be taken into consideration, and in order to provide solutions and prevent the occurrence of the event. In general, four basic axes in prevention and care of accidents are considered:

Safety Culture in Society

Causal studies on the causes of accidents and accidents indicate that the concept of events for most people is something god called for, random and inevitable, while different scientific studies have shown that the distribution of events is based on the characteristics of time, place and person and is totally predictable. Therefore, it is important to establish a desired attitude and proper behavior to prevent accidents in an important safety culture. In other words, the training of the standards and principles of safety should be an integral part of the country's culture and education. The creation of a safety culture in society must be supported by the necessary training. It should be given to them at the age of educating children to help develop their own beliefs and practices. The educational system is the broadest channel for the publication of health knowledge, including education for prevention, as in our community there are more than 1 / 4 of the population. it should be noted that the necessity of implementing education prevention training in schools is one of the vital keys to achieving the maximum capability and ability of individual in the development of the country's future.

The Requirement to Abide by the Laws and Regulations of Health and Safety

In this regard, appropriate organizing such as prevention of worn cars, traffic monitoring and traffic regulations, city co - operation and traffic safety regulations, control of transportation and transportation services in schools and summer camps is a second solution in the shadow of the development of inter - sectoral cooperation.

Compliance with the Standards of Safety and Safety

In design and building of buildings and producing machines and working tools and creating a healthy and academic environment, reforming the school's brigade with regard to the school of health is highly recommended. At the establishment of schools such as the site, the area of the school land, the number of building floors, the number of floors, health services and sanitation and sanitation, the presence of anti - fire extinguishers, and the presence of emergency shelters, the existence of anti - fire extinguishers, and sanitation standards, is the most essential principle of school preparation for the education of children of the community.

Education to Prevent Accidents and Incidents

The training can include:

1. Teaching safety principles in student curricula, at different levels of education.
2. Training the basics of safety and first aid in opportunities possible in film, story, drama, through mass media and a group at home and school.
3. Teaching safety principles to parents and student parents.

The necessity of performing the prevention of accidents for children and adolescents in the country is one of the key process of social development process. Schools, as the most important resources of social and economic development, should take advantage of the participation of organizations and institutions and people on the protection of children's health, prevention and control of events, and taking care of the ways to improve the quality of education in the country over the past and consider it as a religious and social responsibility. in general, one of the important principles in preventing accidents in students is the subject of recognition of the underlying factors. parents, officials and health experts, by identifying and analyzing these factors, can inform their children and students about the various environmental issues, the quality of

communication and the proper enjoyment of the environment, the risks associated with their surrounding factors and how to deal with them. It should be the way in which to develop the sense of trust among the students and not to create fear and concern, the necessity of paying attention to respect for the exercise of their work in their minds. Because the only recognition is to build a student's belief and acceptance of the various issues of life that can pursue potential growth of his forces, and prepare him for a healthy living for his future and his community.[13-14].

4. Construction operations must be planned and implemented in such a way that the potential risks arising from it, inside or outside the workplace, can be prevented as soon as possible. In the event of a risk of life, the employer is obligated to immediately stop work and remove workers from the location of the incident. The employer must ensure that any work-related incident occurs during normal or daily work hours at the workshop as soon as possible and before the related signs and symptoms have been eliminated to the relevant units in the Ministry of Health and Social Work Notify the location[15-16].

Studies and studies on various factors in the workplace as well as research in different fields of technical, statistical, psychiatric, etc., are very helpful in reducing or preventing accidents and diseases resulting from work as well as reducing harmful factors in the workplace and can play an important role in improving the working conditions and environment of workers. Among the factors investigated can be referred to in the context of cases relating to work or machinery, physical and physiological features associated with tools and workers, social - psychological factors, environmental conditions, etc. [17-18].

In order to create safety culture in the workplace, holding training courses is a necessary prelude to which training will have a great impact on reducing accidents caused by the work. There are usually two types of training in work environments, including training training for novice and longer - term training or service training, which is better organized in regular intervals and at

certain intervals. During these training courses, workers are familiar with the occupational hazards in the workplace, procedures, and safety regulations pertaining to their work, and the principles and work of work (work standards).

Material and Methods:

Collect and summarize information from databases PubMed and Google Scholar. Articles research and review using MeSH pattern from: Safety for Buildings, HSE, OSHA, ISO and WHO. Also, according to the standard safety checklist, the necessary information was collected.

The aim of our vast building safety services is to improve the overall safety and efficiency of your buildings and the systems and products you operate within them. Our highly qualified engineers, technicians and expert witnesses perform all manner of testing, assessment and evaluation of industrial systems and equipment against the background of a wide variety of requirements. Naturally our engineering services adhere to all technical and legal regulations, however, we also place great importance on maintaining the standards agreed with contractors without losing sight of cost-efficiency. Whether initial acceptance inspections, repeat testing of technical systems or a safety concept for the facilities: DMT ensures the necessary safety in a wide range of fields [19-20].

As an organization of the TÜV NORD GROUP, we carry out independent tests for a variety of industries and advise our customers on product safety, building safety and plant safety, for example in the fields of:

Building maintenance

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Air quality

Benefit from transparent, competent advice and save high long-term repair costs: Damage caused by ageing and wear on concrete structures cannot be completely

avoided. With our condition assessments and preventive maintenance inspections, however, you can prevent unplanned plant downtimes and safety defects in good time [21]. The early recognition of maintenance requirements can save you cost-intensive repair bills further down the line. With our surveys you can also ensure that operating licences are obtained and an exact budget plan is drawn up: our independent specialists check the structural condition of your building visually, metro logically and by way of sampling and make recommendations for maintenance or repair. You will receive our expert opinions and recommendations in accordance with the applicable standards and regulations. We are certified by the German Association of Material Testing Institutes (VMPA) as a recognized concrete testing center for the determination of compressive strength, flexural strength and water impermeability, on moulded test specimens, and compressive strength on drill cores [22].

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1. Investigations on fresh and hardened concrete in plants, on construction sites or in the laboratory, analysis and interpretation of the results from a single source
2. Assessment of the condition of existing buildings and engineering structures according to DIN 1076
3. Manual inspection: concrete condition, concrete corrosion, reinforcement corrosion, joint condition, joint sealants
4. Core drilling and non-destructive testing methods
5. Testing of aggregate, cements, mortars and screeds
6. Concrete chemical investigations
7. Assessment of water and soils aggressive to concrete
8. Concrete tests: cracks, reinforcement corrosion, white tank
9. Testing the compressive strength and water permeability of concrete test specimens
10. Advising the company and the construction sites on concrete selection and processing
11. Performance of suitability tests, quality and hardening tests
12. Evaluation of concrete tests

Inspection of the equipment of the construction sites and specialist training

Findings

Compliance with these requirements is required in all construction work that is to be cut and welded. Hot and flammable materials. Safety in construction in all places where there is a danger of fire, smoking is prohibited, and the symbol for "hazardousness" Do not smoke "in these places. The burning of any kind of rubbish, scrap and other combustible materials and the like is prohibited unless authorized by the competent authorities. The collection and storage of oil, grease, oilseed rags and oil-contaminated rubbish and oil products, etc., are not permitted on or in the vicinity of construction equipment [23].

All permanent or temporary immersion heaters must be properly installed, so that the walls and wooden parts are less than one meter away, and the carvings and the like are not less than 3 meters apart. Combustible liquids and the like before refueling, the engine must be turned off and the fuel cannot be thrown out of the exhaust and the engine's hot part.

All liquids with a flare point below 7 ° C should not be stored on the surface of the earth unless they are limited to containers or reservoirs. The exhaust and fuel tanks shall not be emptied of where the storage or disposal of the tanks on the engine, exhaust, switchgear and all electric and battery, or other sources of sparking, are spilled. Where flammable liquid vapor is present, spark plugs, such as cigarettes, cabinets, gas, lights and other appliances should not be used [24]. When working with boilers for bitumen and asphalt, appropriate firefighting equipment must be available. Containers containing hot bitumen should not be stored

in the enclosure, unless part of the enclosure is open and ventilation is performed completely and sufficiently. Workers engaged in cooking bitumen and asphalt should be equipped with gloves and forearm protection. The lifting of asphalt or hot bitumen by the worker from the ladder is prohibited [25-26].

As the first factor in the investigation of events, the way to do work at the time of the incident is investigated, and the inspector or members of the audit group will seek answers to questions such as: - Is a safe working order used? Is safe conditions changed over time to unsafe conditions? Is the right tool available? - Have you used the right outfit? Were safety equipment healthy? Was it necessary to use the appropriate shields when necessary? For most of these questions, another important question that arises is: What is the cause if the answer is negative?

The legal responsibility of establishing safe conditions at the workplace with management, as a result of the role of supervisors and top managers, should always be considered in the investigation of the incident. The answers to the questions posed logically leads to more questions such as: - Are safety orders communicated to employees and all employees are aware of them? Is the way in which employees are carried out in a codified fashion? Are things executed according to the instructions? Is proper supervision exercised in implementation? - Are workers trained to do the job? Is there a plan to fix the problems? Are the safe conditions available, corrected? Is maintenance and maintenance services performed periodically and regularly? Are regular periodic inspections carried out?

If a person is affected by social or environmental factors if it is wrong to do otherwise or face physical and mechanical hazards, then something has happened and no harm is done to him. If we eliminate the third factor, non - safe operation and non - safe conditions, despite the occurrence of the first and second factors, there will be no accident and no harm will arise. Therefore, it is noted that if there are flaws and nothing happens, what is the reason

for that! It is also necessary to conduct inspection and discover the defects of employees ' performance and the workplace and communicate and insist on resolving shortcomings, which prevent the process from occurring. [27]. inspections have a great help in preventing diseases and accidents because during inspection, the risks of the work environment are registered and introduced. periodic inspections of the work environment are an important part of the health and safety programmed. The purpose of inspection is to obtain more information about the issues related to them, identify existing risks and potential risks of the work environment and identify and identify the risk - generating factors. Each inspection should determine the case, location, time, and how to do so. It is also important to pay attention to cases that extend non - safe and non - sanitary conditions, including stress, inappropriate coverage, pressure, cold or excessive heat, chemical wastes resulting from reactions, misuse of chemicals and so on[28].

Discussion:

The basis of safety can be expressed in this important statement:

With regard to the issues discussed in the results section, it seems that in order to carry out work on development projects, according to HSE principles, it is necessary to consider some cases as a basis for observance of these principles These include:

1. Culture: To ensure that the principles of HSE, in addition to preserving the life and natural resources, contribute to social development and development. These projects also require culture-building through various educational, written, spoken, visual and other methods.
2. Time: The implementation of HSE principles in various construction, industrial and other projects requires time, because any change that is considered in the system requires a change of attitude, which in turn requires time to accept and adapt to the conditions. New is. The conditions for the projects in

this research are their current conditions, and the next research, after a while, can determine the percentage of project progress in terms of HSE.

3. Cost: Everything requires cost, and the higher the cost is, so it is guaranteed to work with high quality. Since the cost of complying with the principles of HSE has generally been seen so far, so it cannot be expected that all items will be done in a specific way. If the cost of the HSE is also considered at the beginning of the project, it can be expected that the items will be taken in principle.
4. Training: In order to follow the principle of HSE cases, there is a need for training. These trainings should be executed at different levels and levels of contracting and monitoring so that the level of awareness of the risks involved in the development of civil operations between the personnel reaches a common frontier.

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References

1. National Safety Council. 2007. Injury facts, National Safety Council, Itasca, Ill.
2. Everett JG, Frank PB. Costs of accidents and injuries to the construction industry, *J ConstrEng Manag*1996; 122(2):158-64.
3. Zhou Z, Goh YM, Li Q. Overview and analysis of safety management studies in the construction industry, *Safety Sci*2015; 72: 337-50.
4. Afshar A, ZolfagharDolabi HR. Multi-objective optimization of time-cost-safety using genetic algorithm, *Int J Optim Civil Eng* 2014; 4(4):433-50
5. Atashgah KM. Risk assessment and cost estimation in building project in construction phase, MSc thesis, Iran University of Science and Technology, Tehran, 2016.
6. Mamaghani BJ. OHSAS 18001 clarification, Azadehpublication, Tehran, 2004.
7. Cheng CW, Leu SS, Lin CC, Chihhao F. Characteristic analysis of occupational accidents at small construction enterprises, *SafSci*2010; 48(6):698-707.
8. Memarian B, Mitropoulos P. Safety incidents and high-risk activities of masonry construction, *ASCE ConstructResCongr*2012:2510-9.
9. Dewlaney K, Hallowell M, Fortunate III B. Safety risk quantification for high performance sustainable building construction, *JConstructEngManag*2012; 138(8): 964-71.
10. Sun Y, Fang D, Wang S, Dai M, Lv X. Safety risk identification and assessment for Beijing Olympic venues construction, *JManagEng*2008; 40-7.
11. Fung I, Tam V, Lo T, Lu L. Developing a risk assessment model for construction safety, *IntJProject Manag*2010; 28:593-600.
12. Hallowell MR, Gambatese JA. Activity-based safety and health risk quantification for formwork construction, *Construct EngManag*2009; 135(10): 990-8.
13. Kim H, Lee H, Park M, Lee K. Influence factor-based safety risk assessment methodology for construction site, *ASCE Construct ResCongr*2010:13561365.
14. Gurcanli GE, Bilir S, Sevim M. Activity based risk assessment and safety cost estimation for residential building construction projects, *Saf Sci*2015; 80:1-12.
15. Al-Anbari S, Khalina A, Alnuaimi A, Normariah A, Yahya A. Risk assessment of safety and health (RASH) for building construction, *Proc Saf Environ Protec*2015; 95: 149-58.
16. Waehrer GM, Dong XS, Miller T, Haile E, Men Y. Costs of occupational injuries in construction in the United States, *Accid AnalPrev*2007; 39:1258-66.
17. Pellicer E, Carvajal GI, Rubio MC, Catala J. A method to estimate occupational health and safety cost in construction projects, *KSCEJCivilEng*2014; 18(7): 1955-65.

18. Sousa V, Almeida NM, Dias LA. Risk-based management of occupational safety and health in the construction industry –Part 2: Quantitative model, SafSci2015; 74:184-94.
19. Ikpe E, Hammond F, Proverbs D. A cost-benefit analysis (CBA) of construction health and safety management: a theoretical discussion. Procs 24th Annual ARCOM
20. Building Research Establishment Environmental Assessment Method BREEAM. 2006. Building Research Establishment, Garston, Watford, U.K., <http://www.breeam.org>.
21. Construction Industry Institute, Univ. of Texas at Austin.2003. “Safety plus: Making zero accidents a reality.”RS160-1, Austin, Tex.
22. Gambatese, J., Hinze, J., and Haas, C.1997. “Tool to design for construction worker safety.”J. Archit. Eng.,31, 32–41.
23. Gambatese, J. A., Rajendran, S., and Behm, M. G.2006. “Building toward sustainable safety and health.”Proc., ASSE Professional Development Conf., American Society of Safety Engineers ASSE,Seattle.
24. Gilding, P., Humphries, R., and Hogarth, M.2002.Safe companies: A practical path for operationalizing sustainability, ECOS Corporation,Sydney, Australia.
25. Green Building Council of Australia.2006. Sydney, Australia,<http://www.gbca.org.au>.
26. Hill, D. C.2003.Construction safety management and engineering,American Society of Safety Engineers, Des Plaines, Ill.
27. Hinze, J., and Wiegand, J.1992. “Role of designers in constructionworker safety.” J. Constr. Eng. Manage.,1184, 677–684.
28. Jaselskis, E. J., Anderson, S. D., and Russell, J. S.1996. “Strategies for achieving excellence in construction safety performance.”J. Constr.Eng. Manage., 1221, 61–70.