

Identification of Influencing Factors on OHS in Manufacturing Companies Using a Grounded Theory

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Abstract

Background

Over the last few decades, organizations' productivity and occupational health and safety (OHS) performance have improved as a result of the adoption of innovative manufacturing technologies and new management approaches. Despite these improvements, OHS performance in developing nations remains unsatisfactory, and further research is needed to ascertain the factors that influence OHS performance. The purpose of this study was to determine the factors influencing OHS in Iranian manufacturing companies.

Methods

Twelve informants, including OHS inspectors and managers, were interviewed individually for this qualitative study. The interviews were semi-structured, and the data were analyzed using the grounded theory method.

Results

Management commitment, safety culture, OHS training, OHS regulations, economic and political issues, social factors, as well as personal and occupational factors have all been identified.

Conclusion

The findings emphasize the importance of identifying OHS influencing factors in order to improve manufacturing firms' OHS status. Given the limited financial resources available to companies, government assistance and effective OHS training may help in promoting OHS status. Efforts to improve safety culture and to enforce OHS regulations may have an effect on a company's OHS status.

Background

Globally, the application of novel manufacturing technology and new management approaches has a positive effect on manufacturing organizations' productivity rates and occupational health and safety (OHS) performance. Nonetheless, many organizations in developing countries continue to struggle with OHS issues that impede OHS performance. According to studies, the implementation of safety countermeasures had little effect on reducing occupational incidents in the countries [1], and the frequency of occupational incidents is extremely high compared to developed countries [2]. Additionally, organizations have become more sophisticated, making it more difficult to identify OHS influencing factors, and conventional procedures are inadequate at managing the factors.

Numerous studies have explored the causes of poor OHS performance and identified factors that affect OHS in developing nations [3–5]. The world's majority of people live in developing countries [5]. The usage of outdated technologies in manufacturing and the exposure of workers to OHS hazards in conventional industries such as agriculture and primary industries are cited as reasons [6]. Of course, the inappropriate transfer of outdated dangerous technologies from developed to developing countries should not be ignored in terms of aggravating their OHS problems [7–9]. Without a doubt, the development of new technologies strives to improve user safety and welfare. Industrial technology will accelerate production, decrease worker relations with hazardous work processes, and ultimately result in a reduction in occupational incidents. Naturally, it should be considered that improper transmission of safe technologies to developing countries may result in OHS risks for their users. Given the large variation in OHS performance between developed and developing countries, it appears that several factors influence each country's OHS status.

Additionally, research has demonstrated that a variety of factors such as management commitment to safety, safety communication, employee involvement, safety culture, safety training, and OHS regulation all influence how organizations manage OHS [10–14]. It has been established that external factors such as socioeconomic, educational, political, cultural, and legal environments all have an effect on socio-technical systems including workplaces [15]. Rasmussen and Suedung assert that a variety of protective layers, both external and internal, should be provided to an organization in order to avert undesirable events [16]. Furthermore, many macro (organizational design and safety communications) and micro (physical environment and human-machine interaction) factors within the organization might have an effect on the company's OHS status [9]. Identifying OHS influencing factors can help managers and policymakers become aware of the possible risks and take steps to control or mitigate their impact.

The efforts made by industries are insufficient to enhance the state of OHS in developing countries. As a result, analyzing the factors affecting an industry in terms OHS status enables organizations to assess the effectiveness of their OHS efforts. According to the authors' knowledge, just a few studies have been conducted in some Iranian companies. For instance, a recent study discovered that OHS regulations were not being fully enforced in Iranian industrial companies [13]. Additionally, unique factors can have an effect on OHS in various companies. As a result, we decided to conduct a qualitative study with participation of informants from both inside and outside manufacturing organizations in Iran to identify the factors influencing OHS.

Methods

Context and Participants

This study was conducted in Iran's Western Azerbaijan Province to determine the factors that influence the OHS status of manufacturing enterprises. In total twelve informants from outside (three OHS inspectors and two university faculty members) and inside the companies (three OHS managers, two senior managers, and two manufacturing workers) were individually interviewed. Interviews were

conducted with prioritization of the participants outside and then inside the companies. The participants were selected based on their familiarity with the OHS status and their prior work experience with the companies. The participants' mean age was 42.83 years (ranged from 38 to 52 years), and their mean work experience was 17.66 years (ranging from 10 to 26 years).

Data Collection

Following a comprehensive review of the literature, an interview guide was developed to conduct interviews with the informants. The face-to-face interviews were conducted at the participants' workplaces by taking an earlier appointment. We asked questions to identify the internal and external factors influencing occupational health and safety. The primary questions were: what factors from inside and outside organizations can affect OHS status in manufacturing companies? What are your recommendations for improving a company's OHS status?

Data analysis

Interviews were digitally recorded and verbatim transcribed. Each interview's data was analyzed immediately following the interview, and new sub-questions were raised and discussed during the subsequent interview. The texts were coded using common coding techniques including open, axial, and selective. Then, the factors that influence OHS were identified. The data were analyzed using the grounded theory method. Grounded theory is a systematic procedure that enables researchers to develop a theory that is based on data [17]. It is a widely utilized technique that employs inductive strategies while analyzing data [18, 19].

Trustworthiness

To ensure trustworthiness, we used the following procedures. The data was reviewed multiple times throughout the analysis in order to generate categories (constant comparison). The vast majority of participants were contacted to double-check the accuracy of their interviews (member check). Furthermore, triangulation between the study team's researchers and the respondents aided in the incorporation of multiple perspectives during the data gathering and analysis phase.

Ethical Consideration

The study was approved by the UMSU ethics committee. The participants were informed of the study's goal and that their participation was entirely voluntary. The participants also promised that the data would be treated confidentially and anonymous. All participants provided their informed consent.

Results

The data analysis revealed that seven factors influenced the OHS status of manufacturing companies. The factors include management commitment, safety culture, OHS training, OHS regulations, economic and political issues, social factors, individual and occupational factors (Fig. 1).

Management Commitment

The commitment of senior management to OHS was the most important factor affecting OHS in the organizations. The majority of interviewees were dissatisfied with senior management's commitment to OHS. They stated that senior management's belief in OHS and provision of resources are essential for OHS development.

"If managers have a genuine belief in their employees' safety and provide adequate resources for OHS, they will see a positive impact on their firms' OHS performance advancement and efficiency (Participant 12)."

Respondents acknowledged that companies' OHS status should be improved, and OHS officers should be empowered to do a better job. Managers should put a higher value on OHS and assign sufficient power and authority to OHS managers. They should also pay great attention to personnel OHS training and rule updates.

"Managers should support and encourage safety staff to engage in new safety training courses and to share their new knowledge with others (Participant 11)."

Participants cited a lack of managerial support for OHS, providing examples such as inadequate OHS training and unsafe working conditions, and they emphasized necessity financial support for OHS initiatives. The interviewees provided examples of top management's reluctance to support OHS programs in their companies. They include a lack of empowering OHS managers, a senior manager's negative attitude toward the effectiveness of OHS programs, managers' non-attendance at OHS training courses, an insufficient funds for OHS programs, and a lack of employee support.

Ohs Training

The majority of interviewees agreed that a lack of OHS training for employees and management can have a detrimental impact on the company's OHS status. They focused on the key role of safety training in promoting OHS and preventing workplace accidents. Training should be tailored to the learner's OHS needs based on their occupational responsibilities. They also noted employers', managers', and workers' lack of familiarity with OHS principles and rules, theoretic OHS training, OHS inspectors' lack of familiarity with company OHS concerns, and the poor quality of provided training.

"Some workers are unaware of OHS, and they should be provided with the appropriate trainings regarding their workplace safety and health using practical methods and visual means such as films, posters, or

animations (participant 1)".

One of the greatest problem in Iran at the organizational level is a lack of OHS training and awareness amongst management. Because the sole application of theoretical training is not particularly effective in behavior change, company managers should believe in the positive impact of OHS training and use effective training methods to empower workforces.

"Managers have less competence and experience, as well as training in the field of OHS. Some managers don't have higher education and are unaware of OHS. This level of awareness is a barrier to the adoption of safety principles (Participant 7)".

Participants also stated that everyone should obtain appropriate OHS training during their education, particularly at universities, and receive verified certifications for OHS trainings before to starting employment.

Safety Culture

The current study's participants highlighted the lack of a strong safety culture at the workplace and in the surrounding communities, which has a detrimental impact on OHS. According to interviewees, fostering a positive safety culture in the workplace could lead to improved compliance with OHS requirements. The majority of interviewees cited the companies' low safety culture as a result of inadequate OHS training provided to personnel during recruiting and their tenure at the factory. Furthermore, top managers are less concerned with promoting a safety culture since they are more focused with increasing the plant's profitability by manufacturing more commodities. As a result, one of the participants suggested that managers make improving safety culture a top priority.

"The process of improving safety culture should begin with the company's managers; they must be trained to increase their OHS awareness and demonstrate the positive impact of it in the workplace (participant 8)".

Participants emphasized the need of developing an appropriate OHS culture. A portion of this work should be carried out within the factory, taking into account the current culture of the various company units. Efforts to improve the safety culture in the surrounding society can also have a significant impact on improving people's attitudes and behaviors regarding safety. However, it should be noted that this is a time-consuming process. As an example of the positive impact of efforts to promote a safety culture, one of the participants mentioned an increase in the number of persons wearing safety belts when driving.

"As we remember, few car drivers have used a safety belt in recent years; however, as part of efforts to enhance the safety culture, this number has increased dramatically in recent years (participants 10)".

Individual And Occupational Factors

According to participants, many individual characteristics, such as morale, safety belief, literacy level, healthy habits, character, and interest have an impact on OHS in the workplace. They also believed that the application of OHS principles is entirely dependent on a person's moral character, and that a person with a poor moral character cannot genuinely apply safety measures. They believed that people's genuine beliefs about OHS's positive impact on their health and safety at work could have a major effect on their safety behavior. Individual training in the realm of OHS is usually the source of this belief.

Appropriate job experience, job security, welfare provision, and workforce motivational incentives are among the identified occupational factors. Employees' knowledge and skills on the job are usually improved by acquiring more work experience. Employees who work in the workplace will learn further about OHS through the trainings provided if a firm considers OHS to be a priority. With a better understanding of OHS, the number of risky behaviors among workers has often decreased, which can contribute to a reduction in the number of occupational accidents.

Participants criticized the workforce's job insecurity, particularly among workers and company OHS officers. Companies commonly sign relatively short-term job contracts with temporary employees, such as one-month contracts. Because of the high unemployment rate in the surrounding neighborhood and the fear of losing their jobs, this circumstance has a severe impact on their mental focus to safely do their tasks. The impact of job insecurity on OHS status was described by one of the participants as follows:

"Personally, I do not have any organizational support. I'm frightened of being fired, and I can't insist on OHS nonconformities because I rely on this factory for a living. I ignore the current OHS problems and I have to compromise. If I insist on something, my employer can easily claim that my condition is such, and if I do not accept, he can terminate my contract (participant 8)".

Ohs Regulations

One of the most important influencing factors on OHS status has been discovered as a lack of adherence to OHS regulations. The majority of participants stated that a major cause of the inappropriate OHS status was improper enforcement of OHS laws and regulations in the workplace. The degree to which the regulations' requirements are implemented is determined by people's level of participation, which is also influenced by their mentality and level of training regarding the importance of the subject. The level of OHS jurisdiction and the method in which the legislation' requirements are applied are the foundations for achieving intended results and changing human behavior.

Companies do not adequately exploit the experience of successful countries in implementing OHS rules and do not correctly implement the requirements of international standards. Some inadequacies in OHS legislation have a negative impact on company OHS, including an improper structure for implementing the regulations, a lack of enforcement for OHS laws, out-of-date OHS rules, and implementation weaknesses.

"We draw less from the practical experience of successful countries in implementing OHS principles in the workplace. Developed countries have a set of OHS standards that companies must obey. OHS legislation in our country have been documented based on some international standards. However, we face more challenges in enforcing its application by companies (Participant 1)".

Economic And Political Issues

The country's and surrounding society's economic status has been identified as a significant external factor affecting OHS. According to their personal experience, companies are more likely to comply with OHS laws and regulations when the country's economy is strong and the companies are doing well. A large number of manufacturing companies have been forced to close or work at their bare minimum capacity as a result of the bad economy. As a consequence, managers select and purchase less expensive equipment, which has a significant impact on workplace safety by reducing equipment reliability. They lack the requisite financial resources to comply with OHS regulations. The lack of government support for production and the state of OHS are exacerbating the situation in such a bad economic climate.

The hiring of OHS officers, whether permanent or temporary, is influenced by the company's economic situation. Many small manufacturers can't afford to pay their employees' wages on a monthly basis. Furthermore, this situation has caused OHS inspectors to apply insufficient pressure to ensure compliance with OHS regulations. Because of their low socioeconomic status, these pressures can lead to the offender's dismissal from the implementation of OHS requirements.

"Inspectors from OHS authorities who inspect a company have the authority to report OHS deficiencies. Because of the company's specific economic situation, they sometimes disregard the circumstances (participant 12)".

Government policies have an impact on the OHS status of companies. The government's policies have resulted in restrictions on the import of high-tech production processes and equipment into the country, which is one of the reasons why old-fashioned machines with lower safety standards are still in use. Many factories have had difficulty importing raw materials or exporting their products as a result of the political situation.

Social Factors

People's health must become a moral value in society. Residents should not neglect the importance of social factors in the implementation of OHS laws. Education, collective will, and the amount of effort people put forward to change and institutionalize OHS regulations in a society determine the degree of respect for OHS regulations in a community. It is important to remember, however, that changing employees' OHS behaviors takes time. When it comes to deciding how to implement OHS regulations,

OHS authorities and managers should consider social factors. Because community members' knowledge and attitudes influence their acceptance and compliance with OHS regulations.

Policymakers and legislators must have a positive attitude toward OHS, as well as the effort and participation of all individuals are necessary to make a significant change and promote OHS in the workplace, this should be organized and carried out through family and academic training, as well as employee training in the workplace. The participants also attributed the community's success to adherence to regulations, particularly OHS regulations. Because of a lack of respect, improper community routines and habits in the field of OHS have developed.

"Any country that values its citizens will place a higher premium on OHS. I am requesting that our policymakers, lawmakers, and ministries value OHS. Because if they were not value OHS, the lower tiers of society would not value it. (Participant 10) "

Discussion

The main purpose of this study was to discover influencing factors on OHS in manufacturing companies which was conducted with participation of informants from both inside and outside the companies. The identified factors include management commitment, safety culture, OHS training, OHS regulations, economic and political issues, social factors, individual and occupational factors.

The most important factor for the success of safety management systems is management commitment to safety [12, 13]. Organizations with committed managers have been found to have better OHS performance and have been able to continuously improve OHS performance [20–22]. According to the findings of the previous studies, this study found safety commitment as one of the factors influencing OHS status in organizations. The lack of power and authority of safety managers, as well as inadequate support for safety initiatives, were highlighted as the key indications of a lack of management commitment [22]. It appears that company managers' lack of investment in OHS is related to their skepticism regarding the benefits of doing so in terms of improving OHS and increasing the productivity of their organizations. It is essential that these organizations broaden their theoretical understanding of the impact of OHS in the workplace and review other companies' positive experiences in enhancing employee health and productivity. They could also increase their confidence in investing in OHS by properly implementing modest initiatives with the involvement of appropriate professionals and tracking their positive impact on enhancing safety performance. Of course, due to the negative impact of the economic crisis and sanctions, most manufacturing companies in Iran do not currently have the necessary resources for such investment; in this situation, the government's support can be highly encouraging and helpful to OHS improvement.

OHS training has increased in Iranian manufacturing companies in recent years as a result of OHS authorities' pursuit, and these courses are mainly organized by private training organizations. The inadequacy of the provided trainings or a lack of practical training in the workplace could be the root of the reported training issues. Companies, OHS authorities, and trainers appear to lack a thorough

understanding of the concept of training. They are solely convinced that they should get training certifications, regardless of their quality or effectiveness. While organizations' primary goal in offering safety training is to change their employees' knowledge and consequently behavior [23]. The trainings also did not focus on the needs of the participants, such as taking into account their exposure to OHS risks. Because organizations are less familiar with the process of OHS training, theoretical and practical training courses for managers and workers are required. To make positive changes in the behavior of managers and workers in the future, these courses should be prepared with their responsibilities in mind and with the participation of OHS professionals from both inside and outside the organizations.

Previous research has found that having a strong safety culture in a company has a positive impact on industrial safety performance [24], as well as the success of organizations in OHS management [25, 26]. The effectiveness of an organization's safety culture is associated to its efforts to promote safety and has an impact on its safety performance [27, 28]. Safety culture is one of the factors of an organization's level of safety, and a positive safety culture encourages employees to engage in safe activities [29]. The main reasons for the companies' low safety culture were an improper state of society's safety culture and poor safety training. As a result, considerable efforts are required to improve company safety while also providing OHS training to managers and employees. They must make continual efforts for several years to institutionalize a good safety culture in their working environments because they have had a long-term requirement to improve safety culture and achieve good OHS performance.

Individual and occupational characteristics were identified as factors influencing the companies' OHS status in this study. Individual characteristics such as age, experience, and education, as well as job factors such as employment and hazards in the workplace, have been recognized as contributing to the occurrence of occupational accidents in industrial workplaces [30]. Because person, job, and organizational factors interact to generate occupational incidents in the workplace, paying attention to their control can help to prevent incidents.

OHS regulations have developed in order to reduce adverse workplace incidents. Organizations use the regulations as a guideline for better OHS management. The programmatic (conventional) method, in which the end goal is to comply with OHS legislation, is a typical strategy to managing OHS in Iranian organizations. Previous studies regarding the occurrence of occupational incidents in developing nations, such as Iran, reveal that this objective has not been met [5, 31]. This failure could be caused by the factors mentioned in this study, such as improper rules, insufficient structure to meet their requirements in the workplace, and ineffective OHS regulations. Of fact, firms that employ a systematic management approach have also failed to accomplish the system's objectives, such as enhancing safety performance and adhering to OHS regulations [13, 32]. As a result, changing OHS regulations to improve them and increase their enforcement in organizations might be a good strategy to improve the company's OHS status.

Individuals' attitudes, knowledge, and behavior about OHS will be shaped by the type of training they received in their society. Of course, how OHS authorities in the community and organizations inspect and

enforce OHS standards might have an impact on how those trainings are used in practice. As a result, the culture of the society in which individuals live influences the creation of their behavior, and the safety culture that exists in every workplace is derived from the safety culture of the community. Citizens' OHS are a priority for community leaders in various countries, and they do more efforts to preserve and promote their physical and mental health. In light of changes in the field of OHS at the community and workplace levels, the outcomes of these efforts can be evaluated and measured. As a result of industrialized societies' efforts, OHS performance has improved significantly in recent decades [1]. As a result, the identification of the social factor as one of the factors influencing OHS is reasonable.

Each society's policymakers and legislators create OHS legislation based on their knowledge and opinions in the subject. They are considering the community's demands for new regulations, as well as the economic and technological resources to carry out the regulations' obligations. Furthermore, the statesmen of each society take into account the benefits and interests of the people when making judgments in the field of foreign relations and taking actions that could result in economic consequences for the country and its firms. Sanctions on products and technology imports and exports have a significant impact on manufacturing companies' operations, revenue, and the import of safe technologies. Policymakers' attitudes toward importing technologies and without taking into account local conditions in technology transfer will have an impact on workplace OHS. This problem can arise when importing new technologies with high OHS requirements, as well as when importing outdated technologies with minimal OHS requirements. As a result, policymakers should assess whether the outcomes of workplace reforms will have positive or negative implications.

The global economic crisis has had a significant negative impact on many countries, but in some, such as Iran, the impact has been greater. Many small manufacturing enterprises have closed or reduced their production capacity as a result of the situation, which has been exacerbated by economic sanctions. Because the goal of starting a business is to make money, having no income will result in half-activation or even deactivation. While it is true that spending on safety and health will benefit companies in the long-term, this will only be possible if the company's revenue exceeds the cost of production. Manufacturing managers are hesitant to invest in safety and health because of their low profitability, and in some cases, their inability to cover production costs.

In the 2020, Iran's unemployment rate was about 10 percent [33], which is higher than the national average in some regions, such as West Azerbaijan (14.7 percent). As a result, workers have no right to choose a suitable job and must endure working in workplaces with poor OHS conditions. Given the low priority given to safety training in the community, these individuals are unaware of their OHS rights at work. These reasons cause workers to be unconcerned about a company's OHS status, and even if the company has a poor OHS record, they are willing to continue working there. Of course, the inadequacy of insurance and other forms of social assistance for workers has an impact on this. The creation of new manufacturing companies to recruit existing labor can have a good impact on OHS under these conditions, and if possible, government support from manufacturing companies to make workplaces safer.

The current study has limitations of generalizability, data collection, and analysis. Because the current study used a small sample size, generalization of the findings to the broader population may be impossible. Our sample size, on the other hand, is considered adequate for qualitative analysis, and we were able to achieve theoretical saturation. Future research may use quantitative methodologies to investigate the study's goals with a larger sample size. Another limitation was the reliance of the data collecting and coding process on the researchers' individual abilities. While this may jeopardize the analysis' methodological consistency, we applied a constant comparative technique to decrease the danger of bias in coding, conceptualization, and theory development.

Conclusion

The findings emphasize the importance of identifying OHS influencing factors in order to improve OHS status in manufacturing firms. Given the current economic climate, government support for manufacturing enterprises to promote OHS and management support to enhance working conditions can have an impact on preserving and improving employee health and safety. Furthermore, high-quality training has the potential to change managers' attitudes toward OHS and workers' OHS behavior. Although time consuming, actions from outside and inside organizations to improve safety culture can be beneficial in improving the status of OHS in manufacturing companies. Existing OHS regulations in manufacturing companies should be enforced, and new restrictions for the import of technology, particularly outdated unsafe technologies, should be developed. Due to the scarcity of studies on OHS influencing factors in Iran, future research should concentrate on delving deeper into the identified factors in the manufacturing and other industries for OHS promotion.

Abbreviations

OHS
Occupational Health and Safety

Declarations

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Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Authors' contributions

A.G. designed the study and participated in the development of the grant that supported the study. A.G. and E.T. collected the data and participated in data analysis and manuscript preparation. I.M. participated in data analysis and manuscript preparation.

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Ethics approval and consent to participate

The Research Ethics Board at the Urmia University of Medical Sciences approved this study, and all informants participated by their informed consents. The current research was carried out in accordance with relevant guidelines and regulations of the declaration of Helsinki.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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Figures

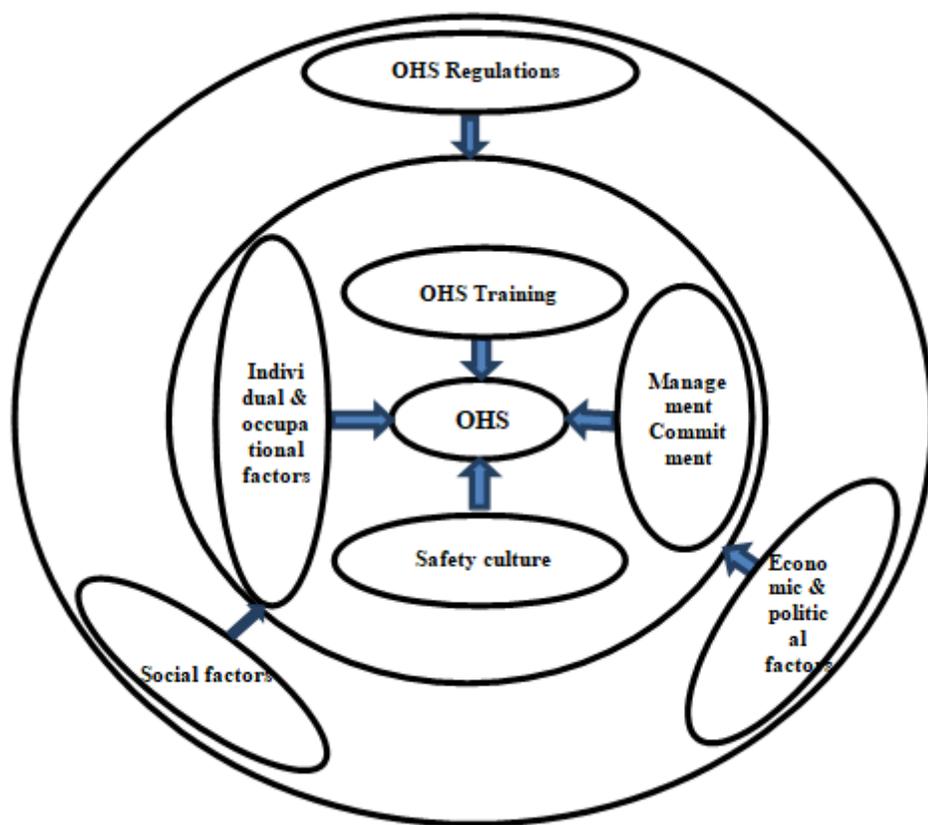


Figure 1

External and internal factors that influence OHS in the companies