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# Assessment of COVID-19 control strategies in a steel industry using a SWOT matrix

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## Abstract

According to the health regulations, industrial environments due to the gathering of people are considered as one of the highest-risk places during the COVID-19 pandemic. Thus, planning with regard to health concerns can decisively help in infection control and continuity of businesses during the pandemic. The aim of this study was to evaluate the COVID-19 control management measures in the Sepid-farab Kavir Steel Complex (SKS complex) located in Isfahan province (Iran) using strengths, weaknesses, opportunities, and threats (SWOT) matrix. After a literature review and field surveys, all weak, strong, threatening, and opportunity points were collected and were listed using the internal factor evaluation (IFE) and external factor evaluation (EFE) matrices and then were prioritized and weighted. Next, given the sum of scores of IFE and EFE, the SWOT matrix was constructed, the disease prevention and control strategies in the complex was determined, and finally, experts proposed corrective measures to improve the current situation. The results of the IFE matrix (IFE) analysis showed that in terms of corona control, there are more weaknesses than strengths within the company (the score of this matrix was 201.12). Also the score of 165 on the EFE matrix indicated that external threats were predominant, compared to external opportunities of company. SWOT analysis showed that despite some external problems and challenges, the existence of a favorable internal decision-making system had an important role in developing appropriate health strategies and implementing effective prevention measures in SKS complex against the COVID-19.

## Keywords

COVID-19, coronavirus, SWOT analysis, work environment

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## Introduction

The novel coronavirus (SARS-CoV-2) was first identified in Wuhan, China (Chen et al., 2020; Wang, Horby, et al., 2020). It is the seventh of the coronavirus family that can infect human beings (Spiteri et al., 2020; Yang and Wang, 2020). The symptoms of COVID-19 infection vary from common cold symptoms to more severe ones similar to diseases such as severe acute respiratory symptom and Middle East respiratory symptoms (Cascella et al., 2020; Zhu et al., 2020). However, 80% of the patients have mild symptoms, and less than 20% of the patients have serious problems (Wu and McGoogan, 2020).

The most important route of transmission is via exposure to tiny respiratory droplets that spread upon sneezing or coughing, contact with the infected person, and contact with virus-contaminated surfaces (Chong

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et al., 2021; Tellier et al., 2019). Despite the high contagious and mortality rates of COVID-19, due to changes in the nature of the virus, definitive drugs and effective and publicly available vaccines are not controlling the disease so far (Deng and Peng, 2020; Liu et al., 2020; Rut et al., 2020; Tellier et al., 2019)

Therefore, according to the protocols of reputable health-related organizations, the use of masks, hand sanitization, disinfection of surfaces, minimizing crowds, observing social distance, and establishing ventilation of places are appropriate ways of prevention and control (Ling et al., 2020; Ou et al., 2020; Sajed and Amgain, 2020; Singh and Adhikari, 2020). This situation has disturbed employees and workers in workplace during the coronavirus pandemic.

A study in Japan has reported that about 80% of workers experienced stress and anxiety over contracting COVID-19 in the workplace, which can be followed by adverse mental and physical outcomes (Sasaki et al., 2020). In another study in Singapore, of 25 first reported cases of coronavirus, 17 cases were infected during occupational exposures (Koh, 2020). Such findings highlight the key role of workplace as a spread venue of diseases during a pandemic (Danovaro-Holliday et al., 2000; Kurgat et al., 2019). Nevertheless, by implementing sanitary practices and policies in the workplace such as public announcements, upgrading of automation systems for teleworking (Morawska et al., 2020; Zhou et al., 2020), and also providing preventive actions instructions and personal protection, the chain of infection among the staffs can be broken (Belingheri et al., 2020; Edwards et al., 2016; Kumar et al., 2013; World Health Organization (WHO), 2020)

However, resuming businesses could be challenging because of increased costs of providing a safe workplace (Zhou et al., 2020). Therefore, to best describe and to realize the problems and challenges pertained to control strategies of the virus and infection in the occupational settings, a qualitative tool is needed to evaluate the carried-out actions. In this situation, using the strengths, weaknesses, opportunities, and threats (SWOT) matrix is the suitable qualitative method utilized for assessing internal and external circumstances of an organization and presenting industrial health and safety strategies (Arshad et al., 2017; Ebrahim et al., 2017; Gürel and Tat, 2017; van Wijngaarden et al., 2012). SWOT analysis was initially developed as an auxiliary tool for better decision-making; however, at the same time, it was used in the analysis of training strategies (Leiber et al., 2018; Longhurst et al., 2020; O'Brien et al., 2020) and in the last two decades, we have seen the use of this method in the strategy of commercial (Martinez, 2017), educational programs (Gaffar et al., 2020; Ganesan and Veena, 2018), as well as the preparation of health and safety strategies in industry (Adem et al., 2018; Suarez et al., 2018). The SWOT matrix logic is established on maximizing strengths and opportunities of a system and minimizing weaknesses and threats as much as possible. Proper application of this logic can lead to excellent results for selection and design of an effective approach (Helms and Nixon, 2010; Longhurst et al., 2020; Wang and Wang, 2020; Zaletel and Maggini, 2020).

The Sepid-farab Kavir Steel Complex (SKS complex) is a good case to asses COVID-19 control strategies over the COVID-19 pandemic. Starting operations in 2007, the complex has the capacity to produce 800,000 tons of steel rebar. Hot rolling is the main process of the SKS and it has 500 personnel. The factory produces reinforced rebar and wired rod that are used in industrial and construction sectors (Ehrampoush et al., 2016)

Regarding to the COVID-19 pandemic and notable role of work environments in infection spread among employees and customers and this fact that adhering to sanitary rudiments is the only current way to tackle COVID-19, the present study was conducted with the aim of assessing control strategies of the virus and infection in SKS complex during COVID-19 pandemic using SWOT matrix.

## Methods

This study was carried out in April 2020 at the SKS complex located in Aran va Bidgol city, Isfahan province, Iran. In this time, the first cases of COVID-19 were officially announced by Iranian authorities for managing preventive strategies and continuing operations within the SKS complex.

The current study is a qualitative study conducted by the use of an internal/external environment assessment method known as SWOT. For this purpose, a team consisting of safety and health engineers, managers, and technical experts was formed. The first step in SWOT was identified and extracted based on the documents and technical knowledge (brain storm) of the managers and then listed. Literature reviews and field studies play an important role in identifying all internal strengths, weaknesses and external opportunities, threats (Anuradha and Sheriff, 2019; Van Durme et al., 2014). Evaluation and ranking

were done with the guidance and training of administrative managers and the consensus of managers and technical engineers. In the next step, EFE and IFE matrices are used to give standard inputs to the SWOT matrix. These two matrices score and prioritize the identified components and in this respect can be the basis for quantitative analysis (Zulkarnain et al., 2018).

Therefore, in the present study, all strategic factors were evaluated (categorization and weighting) using IFE and EFE, important and unimportant factors were determined and prioritized, and finally determining the type of strategy (defensive, offensive, competitive, and conservative) is done via SWOT matrix.

According to the principles of the SWOT matrix, the assigned ranks for external matrix were between 1 and 4 with an average value of 2.5 in which the values 4 through 1 indicate serious opportunity, relative opportunity, relative threat, and serious threat, respectively (Gürel and Tat, 2017; Leigh, 2009). If the final score of the external factor matrix becomes less than 2.5, it would indicate the dominance of threats and a score greater than 2.5 denotes the superiority of the opportunities. The ranking of internal factors follows a similar motif; 4 equals serious strength, 3 means relative strength, 2 suggests relative weakness, and 1 shows serious weakness. In the internal factors matrix, a mean score value less than 2.5 shows weakness and a mean value above 2.5 expresses the strength of internal factors. After the ranking of strategic internal and external factors, based on the expert opinions and view, the weighting coefficient for each factor was assigned from 0 (*unimportant*) to 1 (*highly important*). Using the opinions of the experts, the weight of the factors between 0 and 1 were normalized; the sum of the weighting coefficients assigned to all the factors must be equal to 1. For convenience, the values were multiplied to 100. Then, by multiplying each of the assigned ranks to their importance coefficient, the score of each factor was acquired. Finally, given the sum of scores of internal and external factor matrices, the strategy of the organization to improve the condition was specified. The SWOT matrix is comprised of four strategies described in below:

- Aggressive: Using the internal strengths to exploit external opportunities,
- Conservative: Using the external available opportunities to improve weaknesses within the organization,
- Competitive: Using strengths to diminish the impacts of external threats, and
- Defensive: Minimizing the internal weaknesses while avoiding the threats of the external environment.

In the final stage, by consulting the environmental health engineers and industrial health engineers stationed in the complex, techniques and approaches to improve the circumstances were presented in the form of a strategy for SKS complex (Olyaeemanesh et al., 2018; Wang and Wang, 2020)

## Results

Adaptation of appropriate strategies to evaluate the preventive measures against the spread of COVID-19 infection among workers was carried out using SWOT matrix. The results of the evaluation of internal factors by experts system indicated that the six following factors were the most important strength with 14 points:

- Experience of environmental prevention of COVID-19 by safety and health personnel since the onset (disinfection of sensitive points, provision of control items and equipment, engineering reforms in the system, etc., COVID-19 since the onset),
- Support of the board of directors from the condition of the staff during their illness to provide solace,
- Material and spiritual support of the employees by providing their essential needs and moderating the anxiety burden of their families,
- Establishment of ISO 45001 safety management system,
- Support by senior management of the organization to buy protective tools and equipment,
- Formation of the disaster management headquarters in the complex to tackle with COVID-19.

Together with the score of 14, the aforementioned factors were the strongest aspects, whereas with the score of 3.6, lack of virtual education for the staff due to lack of accommodations for emergency situations was considered as the weakest point. Table 1 presents the strengths (rank 3 and 4) and weaknesses (rank 1 and 2) and their respective coefficients and scores.

**Table 1.** Internal factors evaluation matrix.

| | Strengths | Importance coefficient | Rank (3) and (4) | Score = weight × rank |
|---|---|---|---|---|
| 1 | Existence of a supervised commute service in the complex and potential to increase the number of crowded services to reduce the crowding | 1.4 | 3 | 4.2 |
| 2 | Existence of an organized regular disinfection and sterilization program in the complex | 1.4 | 3 | 4.2 |
| 3 | Potential for cultural activity to fight coronavirus using the education system | 1.4 | 2.6 | 3.64 |
| 4 | The gained experience of the health, safety, and environment (HSE) staff since the pandemic onset | 3.5 | 4 | 14 |
| 5 | Existence of a proper system to distribute masks and disinfectants within the complex | 1.4 | 3.5 | 4.9 |
| 6 | Regular sanitary inspection of the restaurant and serving food only as takeouts | 1.4 | 3 | 4.2 |
| 7 | Managerial board support from the performance of the workers during the pandemic as a stress relieve approach | 3.5 | 4 | 14 |
| 8 | Material and spiritual support of the staff by providing their necessary items and mitigating their mental stress | 3.5 | 4 | 14 |
| 9 | Establishment the ISO 45001 occupational management system | 3.5 | 4 | 14 |
| 10 | Senior manager's support from purchasing tools and equipment | 3.5 | 4 | 14 |
| 11 | Formation of disaster management committee for COVID-19 | 3.5 | 4 | 14 |
| 12 | Presence of a physician in the complex to examine worker's health | 1.4 | 3 | 4.2 |
| 13 | Availability of worker's health record, nutritionist and modification of food service of the restaurant | 1.4 | 3 | 4.2 |
| 14 | Periodical examination of workers and availability of medical records | 1.4 | 3 | 4.2 |
| 15 | Communication and cooperation with the city's health center to exchange experience and to learn new approaches | 1.4 | 2.6 | 3.64 |
| 16 | Existence of responsible business model in the complex | 1.4 | 3 | 4.2 |
| 17 | Conducting social activities to supply medical equipment of the city | 1.4 | 2.6 | 3.64 |
| | **Weaknesses** | **Importance coefficient** | **Rank (1) and (2)** | **Score = weight × rank** |
| 1 | Having incomplete and defective equipment such as defective sprayers, medical thermometer, and medical tools | 3.5 | 1 | 3.5 |
| 2 | Lack of infrastructures for launching an accurate face-detection system, the need to abolish paper-in-payment order and worker payslip, virtual education, lack of software infrastructure to provide convenience for workers | 3.5 | 1 | 3.5 |
| 3 | Lack of infrastructure to accommodate remote working of the staff | 1.7 | 1.5 | 2.55 |
| 4 | Increased risk of infection due to prolonged and frequent overhauls and maintenance services during the pandemic | 3.5 | 1 | 3.5 |
| 5 | Increased risk of infection among the staff due to the arrival of various contractors during repairs | 3.5 | 1 | 3.5 |
| 6 | Lack of management by exception system | 1.7 | 1.5 | 2.55 |
| 7 | Occupational burnout of HSE staff during the pandemic | 3.5 | 1 | 3.5 |
| 8 | Exhaustion and increased burden on the workers due to staff replacement and inevitable double-shift working | 3.5 | 1 | 3.5 |
| 9 | Lack of defined roles for an epidemic | 3.5 | 1 | 3.5 |
| 10 | Teamwork failure during the emergencies | 3.5 | 1 | 3.5 |
| 11 | Lack of access to hygienic taxi services | 3.5 | 1 | 3.5 |
| 12 | Lack of complete supervision by HSE unit over correct usage of personal protective equipment by workers | 3.5 | 1 | 3.5 |
| 13 | Lack of virtual education classes for the staff due to lack of infrastructure for emergency situations | 1.5 | 2.4 | 3.6 |
| 14 | Shortage of HSE personnel in the complex and in the HSE office of Isfahan during the crisis | 3.5 | 1 | 3.5 |

*(continued)*

**Table 1.** (continued)

| Weaknesses | Importance coefficient | Rank (1) and (2) | Score = weight × rank |
|---|---|---|---|
| 15 Lack of appropriate instructions for different activities during the pandemic | 3.5 | 1 | 3.5 |
| 16 Lack of a secure system for remote working | 1.7 | 1.5 | 2.55 |
| 17 Lack of a system of monitoring and controlling cameras for HSE unit | 3.5 | 1 | 3.5 |
| 18 Low availability and responsibility index of the staff during crisis | 1.4 | 2 | 2.8 |
| 19 Lack of a suggestions system | 1.4 | 2 | 2.8 |
| 20 Lack of alternative approaches to replace the infected staff | 3.5 | 1 | 3.5 |
| 21 Limited space in cold storage and food storage to reserve food for crisis situation | 3.5 | 1 | 3.5 |
| 22 Lack of sympathetic relations with the workers in times of hardship and trouble | 1.7 | 1.5 | 2.55 |
| Total | 100 | | 201.12 |

The analysis of opportunities by experts revealed that, with the score of 18, the two factors of availability of sanitary instructions in health centers and communication tools to disseminate information about COVID-19 were regarded as the most important opportunities, whereas with a weighting importance of 8.5, factors such as presence of truck drivers who bring materials and commodities into the complex or load them from the complex to other cities, lack and unequal distribution of health-care facilities across the country during the pandemic, unclarity of diagnostic tests for asymptomatic and symptomatic disease carriers, vulnerability of the stakeholders (i.e. shareholders, buyers, people in factories that supply the raw material), public pressure to halt the operations during disease peak, limited capacity for hospitalization and treatment in central hospitals of the city, and distrust of people in health-care system of the region were viewed as the weakest internal points of the complex. Table 2 presents the opportunities (rank 3 and 4) and threats (rank 1 and 2) and their respective coefficients and scores.

The obtained value of 201.12 from IFE matrix demonstrates that preventive actions conducted in the complex have more weaknesses than strengths. Closeness of this value to 2.5 suggests that there is a small difference between weak and strong points of the complex.

The obtained value of 165 from EFE matrix signifies that there are more threatening factors than opportunities in the organization.

According to the results, the final strategy for COVID-19 prevention in this factory is a defensive strategy based on reducing weaknesses and avoiding threats (Figure 1). Therefore, in compiling of a strategy, extraction of defensive one (weaknesses threat) should be the priority.

After the determination of SKS complex condition using IFE and EFE matrices, efforts were made to develop operational strategies in the integration step using Tables 1 and 2. Table 3 presents the adopted strategies and the measures.

## Discussion

The COVID-19 pandemic has resulted in the world in an emergency state, and the adopted strategies to prevent the spread of the disease has led to unprecedented worldwide shutdowns of industrial and educational sectors and crowded centers (Chin et al., 2020; ILO Monitor, 2020; Rakshit and Paul, 2020; Wang and Wang, 2020). Over the COVID-19 pandemic, the worst economic and business crisis has occurred since the Second World War (ILO Monitor, 2020)

The workplaces are among the high-risk places for the break out of infectious diseases such as COVID-19 (Webster et al., 2019), and the high rates of occupational infection to such diseases are well-documented (Drago and Miller, 2010; Koh, 2020; Wu and McGoogan, 2020). Although resuming work with regard to the safety of the working environment results in financial burden (ILO Monitor, 2020), it is a necessity and requires an evaluation using SWOT matrix to make a safe and sanitary work environment.

Although there are other analytical methods such as gap analysis that analyze and evaluate internally to identify executive deficiencies within the organization (Alshare and Sewailem, 2018; Lawn et al., 2020), but given that the COVID-19 pandemic crisis is an external problem affecting the activities of the

**Table 2.** External factor evaluation matrix.

| | Opportunities | Importance coefficient | Rank (3) and (4) | Score = weight × rank |
|---|---|---|---|---|
| 1 | Availability of sanitary instructions in the health center and other relevant offices | 4.5 | 4 | 18 |
| 2 | Availability of health centers in the region for identification of the disease carriers | 2 | 3 | 6 |
| 3 | Communication and cooperation with the city's health center to transfer experience and to learn new strategies | 2 | 3 | 6 |
| 4 | Availability of a health system provided by ministry of health for staff check-ups | 2 | 3 | 6 |
| 5 | Availability of communication tools to disseminate information about the infection | 4.5 | 4 | 18 |
| 6 | Availability of private medical laboratories for testing and follow-ups of the staff treatment | 2 | 3 | 6 |
| | Threats | Importance coefficient | Rank (1) and (2) | Score = weight × rank |
| 1 | Risk of truck driver's presence coming from other cities in the complex | 8.5 | 1 | 8.5 |
| 2 | Lack of sanitary accommodations across the country during the pandemic and unequal distribution of health-care facilities | 8.5 | 1 | 8.5 |
| 3 | Ambiguous status of diagnostic tests for identifying disease carriers and infected people | 8.5 | 1 | 8.5 |
| 4 | Traffic restrictions within city and between cities during the outbreak | 5 | 1.5 | 7.5 |
| 5 | Vulnerability of the stakeholders (i.e. shareholders, buyers, people in raw material supply factories) | 8.5 | 1 | 8.5 |
| 6 | Public pressure to halt the operations during peak months of the infection | 8.5 | 1 | 8.5 |
| 7 | Mental stress and pressure on the staff induced by their worries of their families | 2 | 2 | 4 |
| 8 | Lack of companies that can provide sanitary and protective equipment in the region | 2 | 2 | 4 |
| 9 | Destructive impact of the pandemic on the activities of the complex in the region | 5 | 1.5 | 7.5 |
| 10 | Insufficient access of staff families to sanitary products due to market scarcity | 5 | 1.5 | 7.5 |
| 11 | Insufficient capacity of central hospitals in the city and distrust of people to health-care system of the region | 8.5 | 1 | 8.5 |
| 12 | Ambiguity in the imposed rules during the pandemic | 2 | 2 | 4 |
| 13 | Insufficient knowledge of the authorities about the disease course | 2 | 2 | 4 |
| 14 | The climate of the region during the outbreak | 2 | 2 | 4 |
| 15 | Improper attitude and misbehavior of the society toward the COVID-19 disease | 5 | 1.5 | 7.5 |
| 16 | Lack of proper infrastructure for insurance agencies for documenting of physical files | 2 | 2 | 4 |
| | Total | 100 | | 165.00 |

organization and on the other hand the solution to control it in addition internal evaluation is related to interactions outside the organization, we used the SWOT matrix, which also evaluates a company with external opportunities and threats.

The result of the current study suggested a defensive strategy for adaptation in the SKS complex to prevent the spread of COVID-19 among the workers. This strategy denoted the dominance of internal weaknesses and external threats over strengths and opportunities of the complex. The material and spiritual support of the workers by management, which is attending to their essential needs, were the main strengths of this study. Actually, the costs of health

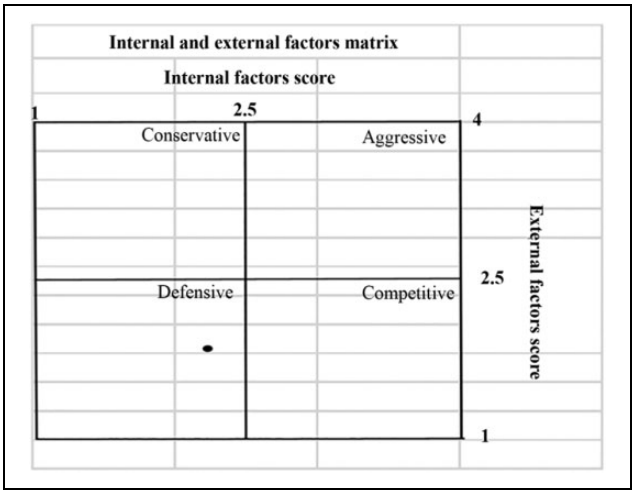


**Figure 1.** The strategic condition of SKS complex in COVID-19 crisis. SKS complex: Sepid-farab Kavir Steel Complex.

care are factors regarded by all authorities worldwide (Olyaeemanesh et al., 2018). Also, setting the ISO 45001 safety management system was considered as a strength in this study as well. The ISO 45001 standard was developed to prevent potential life-threatening events in the workplace and was built following success of other international standards such as Occupational Health and Safety Assessment Series (OHSAS) 18001, international labor organization guidelines (ILO-OSH), and many national standards (Valticos, 2013), hence makes it a great strengthening tool in the current situation.

Lack of virtual education classes for the employees due to shortage of accommodations was considered as the most important weakness of the matrix. Promotion of intelligent working is one of the recommended approaches to reduce the level of contact between personnel and thus reducing the risk of infection (Belingheri et al., 2020). Additionally, communication tools were recognized as one of the effective available external opportunities of the complex. WHO is already using social platforms such as WhatsApp and Facebook to inform and alert populations (Frenkel et al., 2020; Ming et al., 2020; Mejova and Kalimeri, 2020). Countries such as India, Singapore, Canada, United States, and South Korea have initiated the utilization of information and communication technologies (ICTs) to combat the coronavirus pandemic (Bayram et al., 2020; Scott et al., 2020; Whitelaw et al., 2020). This approach had positive results as in Zaman et al. (2020) study in which the SWOT matrix was used to investigate the effects of ICT in COVID-19 prevention (Zaman et al., 2020). Cirrincione et al (2020) suggested restricting travel to and from all "red" areas to other regions as one of the ways of infection prevention (Cirrincione et al., 2020). This policy could not be implemented in our study location as visiting truck drivers from other cities were present in the complex for commercial transport, and therefore, it was recognized as an internal weakness within the complex. Shortage of healthcare accommodations and facilities across the country during the pandemic were realized as another weakness of the complex. This problem was common even in China as it had disrupted supply and demand chain (Wang and Wang, 2020). Moreover, public forces for halting the operations of the complex during peak periods of the infection were an additional identified weakness which is reported to cause heightened anxiety in the society (Li et al., 2020; Qiu et al., 2020; Shigemura et al., 2020; Wang, Pan, et al., 2020). This was illustrated in Sasaki et al. (2020) study on 1421 Japanese full-time employees in which it was found that fear and distress were prevalent among the workers and arose adverse physical and mental outcomes (Sasaki et al., 2020).

One of the most important threats is the lack of health facilities in the country, which the lack of access to effective vaccines for all is part of this threat. If an effective vaccine is provided and be available to all age and gender groups (universal coverage), although it takes a long time to provide for workers, but as an external opportunity, it can have some impact on the results of a recent study. However, despite the production of vaccines in recent months, there is still an emphasis on continuing previous prevention methods.

Holding the regular group meetings and quick scoring of identified factors; were most important benefits of the SWOT matrix in this study. Also, holding a meeting of experts and engineers to discuss the strengths and weaknesses, then directing the discussion toward defining opportunities and threats, and brainstorming shows the effectiveness of SWOT matrix.

Despite the advantages of using the SWOT matrix in this study, limitations such as time consuming were observed, time consuming process was from identifying internal and external factors to prioritizing strategies.In addition to time consuming, in some cases, updating the collected information was also required.

**Table 3.** The strategy, the project, and the compiled actions to tackle with COVID-19 crisis in SKS complex.

| Strategy | Project | Practices |
|---|---|---|
| (1) Establishing and upgrading the infrastructure facilities of the complex to reduce the risk of infection | Developing software systems for internal proceedings | Holding meetings with the IT unit to identify and alarm the threats within the processes of the complex |
| | | Providing software infrastructures of the processes with participation of the respective units and creating their Gantt chart |
| | | Launching related software to prevent the infection transmission |
| | Supplying hardware equipment to adjust infection prevention | Investigating the deficiencies in hardware equipment to prevent entrance and exit processes |
| | | Providing a list of equipment required by IT unit |
| | | Sending the request for required items |
| | | Installation of the purchased items by the contractor |
| (2) Reducing the risk of losing workforce during the crisis | Enhancing physical and mental endurance of the workers | Investigating the results of blood testing and providing the required analysis |
| | | Holding meetings with nutrition consultant to investigate the disease course and nutritional issues |
| | | Holding life skill workshops by psychologist of the complex |
| | | Compiling a comprehensive nutritional plan during the pandemic to enhance immune system |
| | | Training kitchen staff to modify the processes and changing nutritional plan |
| | | Purchasing the influenza vaccine to enhance the immune system of the personnel during the pandemic |
| | | Investigating the trend of changes by the laboratory and providing a progress report |
| | Keeping the wellness of the workers during the pandemic | Investigation for the possibility for flexible working conditions and changing working hours during the pandemic by the disaster committee and providing the necessary enactment |
| | | Investigation for social distancing plans in the complex during the infection by the disaster committee |
| | | Investigating the preparation of sanitation packs for the personnel and their families in several times |
| | | Considering remote working for the staff who work in disaster committee headquarters |

*(continued)*

**Table 3.** (continued)

| Strategy | Project | Practices |
|---|---|---|
| (3) Development and upgrading sanitary and treatment equipment and providing recruits | Supplying medical and sanitary equipment | Investigation of the equipment conditions and accommodations of HSE unit for disease prevention due to entrance and exit processes |
| | | Preparation of a list of equipment required by HSE unit |
| | | Sending the request to buy the required items and providing them |
| | Providing human resources for HSE unit | Investigating staff shortage in the HSE unit during the pandemic |
| | | Submitting the recruitment request for new devoted and efficient staff |
| | | Recruitment and training of committed staff by the HSE unit |
| | | Communique of the respective roles of the staff during the pandemic |
| (4) Promotion of effective communication and cooperation between the units | Formulation of an effective communication and subsequent training in the units during the pandemic | Investigation of communication structure between the units during the pandemic by the disaster committee |
| | | Education of the communication structure to unit deputies by the education unit |
| | | Running workshops for units to teach about emergency preparation to fight coronavirus |
| | Formulation of roles for units during the pandemic | Investigating the staff's awareness from their roles during an epidemic |
| | | Determining the roles of the units during an epidemic in the complex |
| | | Communicating unit roles with the deputies to train the staff and establish operational groups |
| (5) Compiling and presenting proper strategies by deputies of the complex for continuation of the business | Identification of SWOT for continuation of the business | Sending letters to units to compile SWOT during the pandemic |
| | | Analyzing the submitted SWOT to formulate complementary strategic measures of the complex during the pandemic |
| | Compiling of sanitation instructions during the pandemic | Finding high-risk areas in the complex during the pandemic |
| | | Investigating the instructions compiled by the health center for the industries during the pandemic |
| | | Compiling sanitary instructions for different processes in the complex using health center resources |
| | | Communicating the approved sanitary instruction to units to inform and to implement |
| | | Updating the communicated instruction during the pandemic by HSE unit |

SWOT: strengths, weaknesses, opportunities, and threats; IT: information technology; SKS complex: Sepid-farab Kavir Steel Complex.

## Conclusion

With regard to the results of the study, in addition to the obvious effects of the global coronavirus crisis on industries, it was better for industries to examine their current situation to control the virus and the loss of resources. Based on this, a recent study was conducted in Kavir Steel Complex by SWOT matrix and the final strategy for preventing and controlling the COVID-19 epidemic was identified as defensive. Because the most important weaknesses werethe incomplete equipment and facilities to prevent and respond to emergencies (such as the recent pandemic) as well as the lack of infrastructure and incomplete software infrastructure, on the other hand, the lack of health facilities in the community and the risk of the presence of different groups (truck drivers, contractors, etc.) threatens this industry. Creating and upgrading infrastructure equipment and developing infrastructure in the management and engineering sectors with an emphasis on frequent updates will play an important role in preventing and controlling COVID-19. According to the results obtained in total application, SWOT performed well in summarizing and combining effective factors in controlling health crises and formulating preventive strategies.

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