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Editorial

Barriers to Coronavirus Pandemic Control in Industry

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Exposure to the coronavirus in industrial workplaces has caused concern around the world. Implementing preventive measures is the best solution to protect the workers' health. In industrial workplaces, the risk of exposure to coronavirus increases due to enclosed spaces as well as air pollution. In some cases, because of the nature of work, personnel must work in close proximity to each other. They can also use common tools and devices that would increase the risk of spreading the pandemic. Organizations such as OSHA and WHO have provided advice to employers to prevent the spread of the virus in various work situations.[1,2] The United Nations has estimated the financial and economic damage caused by the outbreak at $ 1 trillion worldwide by 2020. This could lead to the destruction of many businesses. [3] The impact of this can be seen in the negative economy in many countries around the world. This pandemic has had devastating effects on the occupational health of workers and personnel in various industries. For example, increasing the working hours of medical personnel, job stress, chronic fatigue, and consequently, reducing the productivity of health care personnel (increasing medical errors and violation of medical ethics) are among the occupational effects of this pandemic. Regarding resilience engineering, these consequences would be associated with reduced resilience of the treatment system as well as working environments. Therefore, with the continuation of the current situation, we will face a population of personnel in medical and industrial environments exposed to burnout.[4] So, how will existing solutions and safety barriers work to address these problems in industry? Since the creation of man, safety barriers have been used to protect man and property against enemies and natural hazards. When human hazards were created due to industrialization, safety barriers were used to prevent accidents because of these hazards.[5] Hollnagel described only two main functions for safety barriers: prevention and protection.[6] Obstacles are considered a means of prevention before the start of a particular event. He assumed that the accident either does not occur, or it slows its progression towards becoming an accident. Obstacles are used as a means of protection after the occurrence of a particular initial event. They protect the environment and individuals, as well as the systems themselves, from the consequences of the accident. Various studies have presented research in this field and have even used artificial intelligence to control this pandemic. For example, the study by Chatterjee et al. (2020) discussed the importance of risk assessment tools for generating

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awareness and making decisions. In addition, the data sets generated through this tool were analyzed to find the main areas of intervention for Covid-19 response and management. Most risk assessment tools focus on tracking down patients or diagnosing a possible health condition through symptoms. Resilience Innovation Knowledge Academy (RIKA) is an innovative risk assessment tool which goes beyond symptom diagnosis and patient tracking. It includes four factors in risk assessment: health, behavior, exposure, and social policy. Each of these four factors has sub-factors that help to assess the overall risk in a more comprehensive way. It also provides the overall risk to the user in a simple way.[7] In a study by Sujath et al. (2020), they presented a model for predicting the spread of Covid-19 pandemic using linear regression, multilayer perceptron and self-regression vector method in India. Information and communication technology uses the perspective of data analysis and data mining to assist in decision-making process based on the past data. The accuracy of the model can be increased by introducing related characteristics such as hospitals, immune system of the infected person, patient's age and sex, measures taken to combat virus replication and so on.[8] But in general, according to the control hierarchy in occupational health and safety engineering, the following can be considered to control and prevent coronary heart disease in industry.

A. Elimination and reduction of risk, which is usually the most important strategy for timely vaccination of all personnel and workers.

B. Engineering measures: The use of engineering measures especially artificial intelligence and information technology can increase the chances of identifying the pattern of behavior of people and the virus. Furthermore, it can perform precautionary measures by analyzing big data. Ventilation and face recognition systems can be considered other control barriers instead of using fingerprints in industry.

c. Management measures: The ease and applicability of individual and managerial controls is much greater in relation to Covid-19 pandemic. Identifying control measures of each layer is the responsibility of the organizations involved in the same layer. In a dynamic (rather than static) system, layers will be constantly evaluating the effectiveness of their actions and making newer decisions. This is the basis of the Deming cycle. Providing necessary training to raise staff awareness and making health equipment and supplies available are other measures managers can take to reduce exposure.

d. Individual measures: Personal protective equipment, use of hand washing soap and disinfectants, maintaining physical distance in different industries, not using common tools and equipment are effective factors in this field.

In addition, having a plan and response in case of emergency for any organization can significantly reduce accidents and diseases in industry. Screening tests, such as the use of thermometers and new detection methods, can also be effective.

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