

## EXAMINING THE EFFECT OF WORK SAFETY AND TECHNICAL PROTECTION ON THE PROCESS OF PRODUCTION MANAGEMENT OF INDUSTRIAL SECTIONS

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### ABSTRACT

Modern management of work life quality has been regarded nowadays as a public social issue. The aim of the present study is to examine the effect of work safety and technical protection on the process of production management of industrial sections across southern districts of West Azerbaijan. The study is descriptive, survey, and applied. The statistical population comprises of 365 managers and technical health technicians working at industrial sections across southern districts of West Azerbaijan. Using Cochran formula, sample size was estimated as 188 and stratified random sampling method was used. Nordik standard questionnaire and Thomas *et al.* scale were employed to measure the development of work safety and technical protection, respectively. To determine the validity, experts and technicians were asked to validate the items. The reliability of questionnaires was measured as 0.863 showing a good command of reliability. To test the hypotheses, multivariate regression coefficient was used to determine the type of relation and linear regression was employed to evaluate the effect of independent variable. The results indicate that development of work safety and technical protection have effect on production management process of industrial sections. The predicting values of effect are 63% and 60%.

**KEYWORDS:** development of work safety, production management process, technical instructions, technical protection, environment health

### INTRODUCTION

Establishing safe and healthy environment should be the key to the goal of every organization and institution in which all detrimental and risky factors are excluded so that the health and security of people including employers, contractors, and consultants are guaranteed. So, all managers, supervisors, and employers would be responsible for establishing, developing and improving health, environment, and safety. In practice, one should establish a consistent system based on the experiences and scientific learning. Hence, establishing and developing appropriate structures for protecting and expanding health, achieving required safety and preventing immediate losses are taken into account as important aspects. Regarding the notion that evolutionary plans are established on consistent development and on human as well as capital, it is essential that these capitals are preserved in qualified way and are set in a fashion that give rise to the overall quality level. Attempt has been made so as to establish a number of steps toward this consideration (Deputy of development and environment, 2011). Industrial humankind endeavors exclusively to adjust himself to technology needs and physical environment. Putting into another way, arms are lengthened to facilitate the achievement to non-access control and to facilitate perceptive senses. In other words, this issue has been increasing from the industrial revolution up to now along with complexity of work and machine. Due to weak compatibility of operator and environment, a great number of lives have been demolished, production capacities have been diminished, and numerous mistakes have been committed.

### Safety in increasing productivity of industrial sections

It is worth noting that safety and technical health principles have direct impact on these cases along with indirect effects on productivity and economic output of industrial sections. In general, financial or physical losses form negative repercussions of industrial events. So, occurrence of events causes deficiency in machines as well as machines and causes irreversible determines.

Presumably, considering that safety and technical health can have important role in productivity of many industrial sections is difficult for some people. In general, increasing the level of productivity in industrial sections is possible through different ways. This is done by means of management methods. It is possible to say that safety and technical health principles have direct and indirect effects on productivity of industrial sections. In addition to above-mentioned

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cases, there are other factors that have direct or indirect impacts on productivity. In addition to economic losses derived from absences, healing expenses, insurance, and other related expenses are said to have considerable effects. Hence, capturing attention toward safety and technical health principles is regarded as important. It is only possible through observing these cases to reduce job-related illness. Relying on the researchers conducted in this field, one can say that drawing attention toward safety and technical health principles has a big part to play in economic-related losses of industrial sections. The reason is that reaction of events recues the probability of risk inducing on equipment and formation of financial losses. As an example in case, one industrial section observed technical health in which absenteeism was reduced from 132 days to 34 days.

### **Strategies of developing health and safety in work place**

Work groups are appropriate targets for developing health since they involve a large number of people which need changes in the concept of work and life. In addition, rapid changes have been made in technology and work conditions, particularly the globalization phenomenon demand increase of efficiency and more production. Many people in industrial and large cities are at work in service-delivering sections. This might be surprising that people do working outside of their working context alike. Such a change in work has led to changes in culture, attitudes, values, and perspectives which have impact on work styles. When considering Iran in this case, one can say that people's lives and works require changes aim with regard to the development of large industrial sections so that a large number of industries are established in small cities and that large industrial cities change to service providing centers. This change has contribution to the need of fundamental change in perceptions, attitudes and health-related behaviors. Hence, world health organization believes that one should enjoy daring of making changes in attitudes and type of management as well as responsibilities. So, it is needed to establish a center to provide work health.

### **Safety standards**

Safety, health and environmental standards are the main concerns of many modern technologies, in this line, a committee involving British Standard Institute, England Certification Issuing companies, and other international standard companies was established in 1998 whose aim was to develop and determine a unit standard. This standard used as basis of developing international standard for ISO organization. In fact, this standard has been developed in order to enable responding to rapid needs of organizations when it comes to a standard system of technical health and safety management which can evaluated and emphasized their management system. The standard is categorized by two section: the first section includes characteristics based on which the certification is issued and the second section involves guidelines for implementing a management system of technical health and safety. In fact, the framework of this standard is compatible with ISO 9001 and ISO 14001.

### **Technical protection and work health**

Article 1. to provide the cooperation of workers and contractors as well as supervising the true implementation of rules related to technical protection and work health, protecting the human force and financial resources across involved workplaces along with preventing the events and diseases derived from work, protecting and increasing the health of workers and cleansing the workplaces, developing committees responsible for technical protection and work health based on principles issued in the agreement are necessary in workplaces. Article 2. Employer is responsible to develop a committee to establish technical protection and work health in workhouses involving 25 workers and this committee involves plenipotentiary representative, work council representative or workhouse workers' representative, technical director. Article 3. Employer are responsible for developing the afore-said committee in workhouses involving 25 workers (Regulation of technical protection committee, 2007).

### **Importance of work-related events**

Every year millions of workers are victims of events leading to the death or disability. According to the statistics published, one worker out of ten workers experiences these events in developed countries annually. Hence, work-related events bring depression of worker and his family members and abolish the capital and economic basis of community.

### **Local studies**

Shraki and Moradi (2013) evaluate the risk in workplace using analysis of work safety, nominal group method, and fuzzy TOPSIS, based on the results of the study, it was found that in William Fine method, risks were ranked as gas an

height, psychological stress, fire, explosion and electricity, and height. In addition, in suggested method, psychological stress, fire, transportation, electricity, equipment in height, gas, explosion, and height were ranked accordingly. The results indicated that since the suggested method increased the power of risk identification, its application is suggested to determine the ranking of risks.

Alizade *et al.* (2011) evaluated the operational risk of chemical materials and effects of explosive chemicals were studied in relation to housings and neighborhood industrial districts. Sepehrian (2009) developed a model for safety, work health, and environment management in project-oriented organizations. Reviewing safety, job health, and environment management of several project-oriented companies which managed dam-constructing projects across Iran, the stud attempted to develop a model. In fact, the model could establish a connection between safety, job health, and environment goals and macro goals of organization.

### International studies

Brown *et al.* (2000) develop a polling related to social, technical and personal factors in a research entitled predicting the performance of healthy employer in steel industry. The results manifested that a chain-based reaction is used in relation to technical and social structures through employers to induce impact on health behaviors. These findings indicate that safety risks, safety culture, and production pressure have effects on safety effectiveness leading to healthy behaviors or insecure. Niskanen *et al.* (2014) examined the supervising and control-bead effects on health and health of employers in job context. They concluded that safety and health of employers should be prosecuted in an effective way so that safety and technical health system of employers are practiced. Supervisors should provide suggestions to job contexts higher than the legal level. McCaughey *et al.* (2013) concluded in their study that the detriments derived by job context and diseases were correlate with security context. Perceiving security context is an intermediate variable between the relationship of deficiencies caused by job context as well as days of disease and three variables (job stress, tendency to desertion, job satisfaction). It is proved that health managers require to involve themselves in increasing the perception of context and working conditions which lead to reaction of events and diseases so as to improve the perception of safety context and employers repercussions.

### MATERIALS AND METHODS

The study is survey in terms of design. It is applied and descriptive in terms of goal and quality of data collection, respectively. Stratified random sampling method is used in the study. The rate of success (p) and rate of failure ( $p = 1 - q$ ) were considered as 50% and 50%, respectively. To determine the sample size as 188, Morgan table was used. To collect the required data, questionnaires were distributed among the participants and were registered in SPS software. Descriptive statistics was used including frequency, relative frequency percent, central tendency indexes, and scattering indexes. Inferential statistics were used to analyze the data accordingly.

### Inferential analysis of statistical data

Nordik questionnaire and Thomas (2002) questionnaire were used to evaluate the development of job safety and production management process to study the technical protection. The questionnaire involved 36 items develop in Likert-five item sale. Cronbach alpha coefficient was used to measure the reliability which was obtained as 0.836, showing good command of reliability. The analysis results indicate that 139 and 48 participants are male and female, respectively. Hence, 94% and 53% of the participants are male and female constitute the sample. Also, 6.6%, 7.27%, 4.6%, and 1% of the participants fall into age range of 20-25 years, 25-30 years, 30-35 years, and higher than 40 years respectively.

### RESULTS AND DISCUSSION

Testing first hypothesis

Development of job safety has an effect on production management process of industrial sectors in southern districts of West Azerbaijan

**Table 1. Multivariate correlation coefficient for the first hypothesis**

Model	Correlation Coefficient	R Square	Balanced R Square	Standard Error
1	0.636	0.405	0.402	0.52761

Multivariate correlation coefficient shows the extent of correlation among independent and dependent variables. The value falls between 0 and 1. The more the value is closer to 1 coefficient, there is stronger correlation between independent variables and dependent variable to be reported as 0.636. The determining factor equals to multivariate correlation coefficient.

Determining factor of variance and changes of dependent variable is demonstrated by independent variables. The value falls between 0 and 1. The closer the value to 1 coefficient, more determining of indent variables will be. The coefficient is 0.405. In other words, 40% of the variance related to dependent variable is determined by independent variables.

**Table 2. Coefficient of regression model for the first hypothesis**

Model	Sum Of Squares	Degree Of Freedom	Mean Square	Frequency	Level Of Significance
Regression	35.259	1	35.259	115.99	0.000
Residue	51.777	187	0.278		
Total	87.036	187			

The obtained F value (99.115) is less than 0.001 level of significance. This indicates that the independent variable can describe the changes and variance of dependent variable. Putting in other words, the regression model of the study is a good model and one is able to determine the changes of dependent variable based on the assumed independent variable.

**Table 3. Regression coefficients of first main hypothesis**

Model	Non-Standard Beta Coefficient	Non-Standard Beta Error	Standard Beta Coefficient	T Statistic	Level Of Significance
Constant Value	1.100	0.231		4.758	0.000
Variable	0.631	0.056	0.636	11.254	0.000

According to the obtained results and the level of significance, one can say that clarity variable has an effect on attitude variable since the level of significance is less than 0.05 (rejection of null hypothesis). Also, development of job safety has regression effect on dependent variable.

**Table 4. Multivariate correlation coefficient for the second main hypothesis**

Model	Correlation Coefficient	R Square	Balanced R Square	Standard Error
1	0.776	0.602	0.599	0.39471

Multivariate correlation coefficient shows the extent of correlation among independent and dependent variables. The value falls between 0 and 1. The more the value is closer to 1 coefficient, there is stronger correlation between independent variables and dependent variable to be reported as 0.776. The determining factor equals to multivariate correlation coefficient. Determining factor of variance and changes of dependent variable is demonstrated by independent variables. The value falls between 0 and 1. The closer the value to 1 coefficient, more determining of indent variables will be. The coefficient is 0.602. In other words, 60% of the variance related to dependent variable is determined by independent variables.

**Table 5. Regression model coefficient for the second main hypothesis**

Model	Sum Of Squares	Degree Of Freedom	Mean Square	Frequency	Level Of Significance
Regression	43.743	1	43.743	280.775	0.000b
Residue	28.977	187	0.156		
Total	72.720	187			

The obtained F value (280.775) is less than 0.001 level of significance. This indicates that the independent variable can describe the changes and variance of dependent variable. Putting in other words, the regression model of the study is a good model and one is able to determine the changes of dependent variable based on the assumed independent variable.

**Table 6. Regression coefficients of second main hypothesis**

Model	Non-Standard Beta Coefficient	Non-Standard Beta Error	Standard Beta Coefficient	T Statistic	Level Of Significance
Constant Value	1.341	0.173		7.752	0.000
Variable	0.702	0.042	0.776	16.756	0.000

According to the obtained results and the level of significance, one can say that technical protection variable has an effect on production management process in industrial sectors. Since the level of significance is less than 0.05 (rejection of null hypothesis). Also, development of job safety has regression effect (0.776 regression coefficient) on dependent variable.

### SUGGESTIONS

Developing methods and programs for the development of work safety in the process of production management of industrial sectors in southern districts of West Azerbaijan.

Developing policies and guidelines for technical protection in the process of production management of industrial sectors in southern districts of West Azerbaijan.

Employing information systems to collect the information bank of events in the process of production management of industrial sectors in southern districts of West Azerbaijan.

Comprehensive reporting in order to highlight the center of event in the process of production management of industrial sectors in southern districts of West Azerbaijan.

Reviewing the resources and methods discussed across the globe in relation to providing technical instruction in the process of production management of industrial sectors in southern districts of West Azerbaijan.

Using comprehensive agreements and developing regularities in order to develop the health level of context in the process of production management of industrial sectors in southern districts of West Azerbaijan.

Preparing and developing organizational strategies in line with producing and using standard instruments in the process of production management of industrial sectors in southern districts of West Azerbaijan.

Periodical investigation in line with technical supervision of tools and machines in the process of production management of industrial sectors in southern districts of West Azerbaijan.

Using technician and experienced managers in relation to supervising the establishment of machines in the process of production management of industrial sectors in southern districts of West Azerbaijan.

Using experienced employers for technical instructions in the process of production management of industrial sectors in southern districts of West Azerbaijan.

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