

# Fuzzy Delphi technique application in designing the managers' professional ethics factors model with an emphasis on the mine workers' mental health in the form of interpretive structural modeling

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## Abstract

This research aims to design a pattern for managers' professional ethics factors focusing on the mine workers' mental health. This research's method, which is based on the interpretative paradigm, is developmental, respecting the goal, and it has an exploratory-analytical nature by an inductive approach adoption, and it has used mixed research (qualitative/quantitative) from the statistical community of industry and university experts through a targeted sampling method. Three steps have been considered to achieve the research's main goal. The factors of the managers' professional ethics have been identified in the research's first step through investigating the published articles at the national and international level with content analysis method by NVIVO software, and then, the 15 main factors were finalized and confirmed through the Delphi method and using EXCEL software in the second step in order to naturalize the factors extracted from the articles emphasizing its effect on mine workers' mental health. The factors rating and pattern presentation were done in the third step using the ISM method. The present research has provided the factors of professional ethics of Iranian mine managers and the relationships between these factors emphasizing the mine workers' mental health to be applied by the mining industries' managers of Iran and invited them to pay extra attention to factors such as characteristic traits and perceptual skills which are the most effective variables through presenting a pattern of managers' professional ethics factors.

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## 1 Introduction

Mining industries have a different nature, both respecting commercial and production methods and also human resources. Mine managers will not be able to gain a competitive advantage if they only focus on the development

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of extraction and exploitation processes and neglect the effective management of human resources. Obviously, the organizations' managers and employees require a set of ethical and value guidelines, in addition to organizational and legal criteria, to achieve the business goals in order to help them in dealing with employees and enable a kind of process coordination and unity moving towards the desired collective and public acceptance [19]. Today, ethics has been known as one of the most important variables in an organization's success, and professional ethics governance is able to significantly help the organization to reduce tensions and success in the achievement of its goals. Therefore, possessing professional ethics in organizations is raised as a competitive advantage [16]. Professional ethics is a logical thinking process that aims to understand which one of the values should be maintained and published in an organization. Also, professional ethics includes a set of accepted ethical actions and responses providing the desirable social relations for their members in their professional duties. In other words, it is a kind of moral commitment and conscientiousness towards any kind of work, duty, and responsibility. Although professional ethics are essential in all jobs, they are very important in management [8]. On the other hand, there is a possibility that the managers will be faced with ethical conflicts due to the difficulty and problems of the activity. Consequently, we are afraid that this will lead to job stress for the employees and finally disturb their power to make correct decisions and their mental health. In a situation where the possibility of ethical, correct, and human values-based decisions is disturbed by managers, the employees are faced with ethical puzzles in their workplace, and they are forced to move in a direction in contrast with their ethical beliefs or the ethical beliefs governing their workplace which is strongly very challenging for organization and also themselves [1]. Mental health is one the main components of public health, and mental healthcare is the ability to establish a balance in life and resist problems. Mental problems put considerable pressure on people. Nowadays, mental stress is one of the important issues in life [33].

Mines, as one of the infrastructure sectors of the economy, play a fundamental role in meeting the needs of many industries and other economic sectors of the country; quantitative and qualitative recognition of human resources' characteristics is one of the essentials of efficient management of this sector. Given that manpower management in the mining industry is a difficult and challenging task, and manpower is known as one of the most important resources in mines to successfully implement the programs, and on the other hand, little attention is paid to it because of the intangibility of manpower costs compared to other resources such as materials and machinery, therefore, practical knowledge about human resource topics such as recruitment, service compensation and performance evaluation in mines is limited. Certainly, the initial decisions regarding human resources have a significant effect on the mining industry success, and it is possible to improve performance through correct human resources management, which depends on proper planning and development. It should be mentioned that professional ethics observance by managers is considered one of the most important variables in the organization's success nowadays, and in recent decades, the organizations' managers have realized the importance of infusing professional ethics into the organizations' vital arteries and now they know that the ethics element is considered as one of the factors for the organization stability and its ultimate goals achievement. Also, one of the most basic principles for establishing healthy and effective communication among the organizations' employees is the observance of the professional ethics principles by the organizations' managers. But in today's world, many ethical principles have been neglected among the organizations' managers due to the increasingly expansion of technology, the wide establishment of communication in the virtual environment, and the lack of attention to the human's mental and spiritual dimensions and unfamiliarity with the principles and techniques of management and professional behavior and ignoring ethical standards has caused many problems in organizations.

The researcher's incentive for conducting this study refers to the fact that one of the features of a healthy workplace is that the employees' mental and physical health should be taken into consideration, and the interest of mine managers as much as the production and productivity have been emphasized. The responsibility of production organizations in a healthy society is not limited to producing profitable goods and services as much as possible, and the organizations' managers in such societies know that more production is the result and product of effective management. Effective management cannot be achieved without regard and belief in the employees' mental health. One of the goals of mental health in the workplace is preventing the emergence of difficulties caused by behavioral disorders and psychological distress of some employees and applying the recommendations of experts to diagnose and treat mental illnesses in the workplace. Given that very little researches has also been conducted in Iran regarding mine managers' professional ethics focusing on mine workers' mental health and according to what was mentioned, considering Iran's pure conditions in terms of the existence of various and different mines, the research, in this case, can provide valuable information for decision-makers in the mining industry and human resources to gain knowledge about the factors of the managers' professional ethics with an emphasis on its impact on the employees' mental health in this field. Although there have been some studies on the factors of managers' professional ethics in other industries except mining, a comprehensive study focusing on identifying the managers' professional ethics factors emphasizing the employees' mental health with a mixed approach and providing a model in this field has not been done. Therefore, the present research aims to

determine the factors of managers' professional ethics emphasizing the employees' mental health and present a model related to it in a localized form in Iranian mines.

The main question of this research is identifying the factors of managers' professional ethics with an emphasis on the employees' mental health and providing a model of the managers' professional ethics factors focusing on the mine workers' mental health.

## 2 Literature review

The ethics concept is frequently applied in routine conversations without complete clarification of its meaning. But this is a complicated concept and needs more clarification. We sometimes know ethics as the description of state or behavior, and sometimes, else, we mean systematic knowledge. Ethics science is connected to the scientific study that focuses more on the values, norms, and principles for human life and action [7]. Ethics topic and concepts it is always one the main and the most challenging discussions related to human, which dates back to the beginning of mankind. Given the comprehensive growth of the world surrounding us in many areas, ethics and its observance topic has become more important than ever in such a way that this field is growing and changing along with other scientific fields [9]. Professional ethics means recognizing right from wrong in the workplace and then doing right and leaving wrong. Professional ethics was emerged as a branch of management knowledge since the emergence of the social responsibility movement in the 1960s [25]. Professional ethics is a form of applied ethics that examines the ethical principles or problems of human resources, which are seen in the workplace a lot, and it is a kind of ethical commitment and work conscience towards any kind of work, duty, and responsibility. Professional ethics include beliefs, values, norms, and actions related to the types of work in a society, which are fixed in the personality of the people of a society and are produced and reproduced in different institutions of society. The principles of professional ethics in organizations are presented to employees in the form of an ethical charter or regulations. Professional ethics observance leads to an organization's position promotion in its business field [23].

Mental health includes the ability to live happily, productively, and without any problems. Mental health is an abstract concept and a relativistic assessment of human relationships with society and its values, and it cannot be understood separately from other multi-factorial events, making persons do what they do in society. Mental health is the way a person adapts to the world [3]. Mental health is the full capacity of living in a way that enables us to realize our natural capacities, and it establishes a kind of unity between us and others instead of separating us from other people who build our world. Mental health is the ability to make love and creation, a kind of identity sense on one's own experience as the power subject and agent accompanied with the understanding of the reality inside and outside oneself and realism and reasoning development [31]. There were many plans and programs in the past to support the employees' mental and physical health at the workplace, which have lost their efficiency today and need to be changed. Many companies at the board of directors level pay insufficient attention to employees' welfare, which is considered a threat to employees' productivity. It also causes an increase in employee turnover in the workplace and leads to some difficulty for companies in attracting and retaining the workforce. However, companies must change their processes in the modern business world and pay attention to the employees' health at the workplace more than before [2]. Anxiety, stress, and job burnout in the workplace are often considered one of the main factors of employee resignation, and consequently, a large number of employees voluntarily leave their jobs. Leaders must create an environment in which employees have a sense of worthiness and help them to have a good feeling in all aspects of their lives in order to retain talented people in the company and also take steps on the right managerial path [15].

In the numerous researches conducted by the researchers on the management trends, especially industrial management, the researchers paid less attention to the interdisciplinary field of managers' professional ethics and especially the emphasis on the employees' mental health in a key industry of Iran, which can be the basis of gaining a sustainable competitive advantage at the international level, and we can say that Iran's mining industry has been neglected by researchers, especially regarding industrial management field in spite of its huge reserves; therefore, the present research can be considered as innovative and new research providing a good opportunity for the mining industries development. The existence of the various rich mines in Iran has made it one of the main mineral producers in the world. Mining productivity, as all the construction and development activities, will also have significant technical, social, and environmental impacts. Therefore, research that helps to improve the knowledge of managers and decision-makers in this industry and smooth the way for a suitable management approach adoption is very important. The present research applies an inductive approach to identify the professional ethics factors of mining industry managers in Iran and studies the factors derived from the published scientific articles at the national and international levels are monitored using the experts' opinions in this field in order to influence on the employees' the mental health. The classification of the related factors and patterns can help managers who are eager to use the scientific research results in their business

to prioritize the factors. According to the above topics, this research has aimed to answer the following questions:

1. What are the factors of managers' professional ethics?
2. What are the factors of the localized managers' professional ethics emphasizing the mine workers' mental health?
3. How is the pattern of the managers' professional ethics factors emphasizing the mental health of mine workers?

### 3 Research methodology

This research includes three stages in order to achieve its goals. The managers' professional ethics factors are identified in the first stage. The managers' professional ethics factors are adopted in the second stage, emphasizing the mental health of mine workers, and a pattern is provided for the mine managers' professional ethics factors emphasizing the mental health of mine workers in the third stage. In terms of research philosophy, this research is a study with an interpretative paradigm, and it is a development that follows an inductive approach respecting the goal. This research is an exploratory-analytical study respecting nature, which is considered mixed research in terms of data collection methodology. Also, this is a library and field method of research in terms of data collection method. On the other hand, the strategy of each stage is different, respecting the fact that this research consists of three stages regarding the research strategy. A strategy with the qualitative content analysis approach is used in the identification stage in identifying the factors of managers' professional ethics, and the Delphi technique has been used in the second stage to adapt the factors with an emphasis on the employees' mental health. The interpretive structural modeling method has been used in the third stage to present the model of mine managers' professional ethics factors, emphasizing its impact on the mining employees' mental health. Note-taking is the collection tool in the first stage, and the questionnaire is used for this purpose in the second and third stages.

The statistical population at the first stage includes all the articles related to the topic of the managers' professional ethics factors identification, which is unlimited. The SID database for Persian articles (121 articles), Emerald database during the printing period from 2015 to 2022 (12 articles) and Science database in the printing period from 2015 to 2022 (14 articles) for international articles were selected to obtain the required information using the purposive sampling method which included 147 articles and finally, 74 articles have been selected considering some criteria such as having factors related to the managers' professional ethics, professional ethics indexes, etc. For the purpose of adapting the identified factors with an emphasis on the employees' mental health at the second stage, the statistical population in this section includes academic and industry professors and experts, with the condition of being aware of the subject of the managers' professional ethics focusing on the employees' mental health. The sample size at this stage is equal to 12 experts. Targeted sampling is used in this step as a sampling method. In the third stage, the statistical community includes academic and industry professors and experts with the condition of being aware of the subject of managers' professional ethics, focusing on its impact on the employees' mental health in order to present the pattern of the mine managers' professional ethics factors focusing on the mine workers' mental health of mine workers who are the same experts from the previous stage.

The data collection method at the first stage is library study. Note-taking of the different articles related to the topic is used in this stage for collecting data. The questionnaire has been used in the second and third stages. Lincoln and Guba's assessment method, which is applicable to the Validation of qualitative research, has been used at the first stage to achieve reliability and validity. For the sake of validity and reliability assessment in qualitative studies, Mohsenpour [24] stated that Validity, verifiability, repeatability, and provability are based on the four axes., four criteria including acceptability, reliability, transferability, and confirmability were used in this stage for validity and reliability. Fifteen articles were firstly analyzed in terms of content in this section, written and then delivered to the experts, and the reliability and validity of the studied items were confirmed. This method has also been used at the second stage in which the Delphi method has been applied. The paired comparison questionnaire is the tool in the third step. The research expert's questionnaire can be checked by calculating the compatibility index. The inconsistency index is used to check the questionnaire. These indexes state that if the inconsistency rate of pairwise comparisons is more than 0.1, it is better to recheck the comparisons. According to Khaki's opinion [20], all the relevant possibilities will be lost in the absence of one variable because all the model's factors are considered in the questionnaire and compared with each other. On the other hand, the maximum possible questions are asked from the audience with a desired structure because the questionnaire compares and evaluates all the criteria pairwise, and there will be no need for reliability assessment since all the criteria have been taken into account in this assessment and the designer is not able to have a specific orientation in designing the questions.

The qualitative content analysis approach is the analysis method at the first stage, which is conducted by the NVIVO software application. Content analysis is one of the documentary methods that studies the communication

messages through a systematic, objective, quantitative, and generalizable examination way. The Delphi method is used in the second stage to analyze data, and the results are determined by using Excel software. The interpretive structural modeling method is applied at the third stage for data analysis, in which data was analyzed using Excel and MICMAC software.

## 4 Research's findings

This research aims to provide a pattern for the managers' professional ethics factors focusing on the mine workers' mental health, which is examined through three stages.

### 4.1 Identification of the managers' professional ethics factors

The qualitative content analysis approach is the analysis method at this stage. Content analysis is one of the documentary methods that studies the communication messages through a systematic, objective, quantitative, and generalizable examination way. The managers' professional ethics factors are examined at this stage, respecting the international and domestic articles on which qualitative analysis is conducted to determine a primary framework for the researcher. The following results were identified as the factors of managers' professional ethics using the content analysis method and the application of NVIVO software. The qualitative analysis of the articles has been presented in Table 1.

Table 1: The factors of the managers' professional ethics extracted from international and domestic articles

Row	Factor	References
1	Characteristic traits	[5, 11, 12, 14, 22, 26, 27, 28, 29]
2	Perceptual skill	[5, 10, 12, 14, 17, 21, 26, 28]
3	observance and respect toward social values and norms	[5, 6, 11, 12, 13, 14, 17, 27, 28, 29, 32]
4	Interaction with colleagues	[4, 6, 10, 12, 14, 17, 26, 27, 29, 30]
5	Organizational morality	[4, 5, 6, 11, 14, 22, 28, 29, 32]
6	Commitment	[6, 10, 11, 13, 14, 17, 21, 26, 27, 28, 30, 32]
7	Professional expertise	[5, 10, 12, 14, 22, 26, 28, 29]
8	Accountability	[4, 6, 11, 12, 13, 17, 18, 21, 26, 27, 30, 32]
9	Superiority-seeking and competitiveness	[6, 10, 17, 21, 27, 30]
10	Honesty and realism	[10, 11, 13, 17, 21, 28, 30, 32]
11	Justice and fairness	[6, 10, 11, 13, 17, 21, 26, 28, 30, 32]
12	Sympathy with others	[6, 10, 11, 12, 17, 26]
13	Royalty	[11, 13, 17, 21, 28, 30, 32]
14	Safekeeping	[10, 17, 21, 26, 27, 28, 30, 32]
15	Giving priority to job	[4, 6, 10, 17, 13, 27, 28, 32]
16	Observing the competency principle	[6, 11, 12, 13, 17, 26, 28, 32]
17	Observing justice in the organization	[4, 6, 10, 11, 12, 17, 30, 32]
18	Protecting the employees' rights in terms of training and promotion	[6, 12, 17, 21, 27, 28, 32]
19	Commitment to reduce jobs injuries	[6, 11, 12, 17, 21]
20	Commitment to the jobs' professional health implementation	[12, 21, 28, 30]
21	Employees' psychological strengthening	[6, 11, 12, 13, 17, 21, 28, 32]
22	human dignity Preservation	[4, 6, 10, 11, 12, 13, 17, 27, 28]
23	Transparency in work	[6, 11, 12, 17, 27, 28, 30]

The managers' professional ethics factors were extracted through a systematic review of theoretical literature and qualitative content analysis of the factors using NVIVO software. The output of this stage of research was 23 factors.

### 4.2 Localization of managers' professional ethics factors with an emphasis on employees' mental health

In the second stage, the researcher referred to the experts for identification of the managers' professional ethics factors with an emphasis on the employees' mental health, and the factors are localized according to the industry under investigation, which means mining through providing some explanations and the Delphi method. The designed questionnaire is answered at this stage. This questionnaire's question is this: "What are the factors of the managers' professional ethics with an emphasis on the employees' mental health?" Twenty-three factors extracted from the previous stage are presented to the experts to answer this question. Kendall's coordination coefficient was used in this research to determine the level of consensus among experts using the Delphi method. The Kendall W coefficient greater than or equal to 0.5 is considered a measure of the correlation of the participants' views to check the general agreement rate and consensus among the members.

The verbal variables are firstly defined as triangular fuzzy numbers following collecting the questionnaires of Delphi's first step. In this way, triangular fuzzy numbers are given to the view of each one of the experts, and a set of triangular fuzzy numbers is obtained for each expert by using Relation (4.1). The average set of  $(A^{(i)}_m)$  of all the sets of  $(A^{(i)})$  is also calculated through Relation (4.2). Then, the amount of each expert's disagreement from the average is calculated using Relation (4.3):

$$\tilde{A}^{(i)} = (a_1^{(i)}, a_2^{(i)}, a_3^{(i)}), \quad i = 1, 2, \dots, n \quad (4.1)$$

$$\tilde{A}_m = (a_{m1}, a_{m2}, a_{m3}) = \left( \sum_{i=1}^n a_1^i, \sum_{i=1}^n a_2^i, \sum_{i=1}^n a_3^i \right) \quad (4.2)$$

$$(a_{m1} - a_1^{(i)}, a_{m2} - a_2^{(i)}, a_{m3} - a_3^{(i)}) = \left( \sum_{i=1}^n a_1^i - a_1^{(i)}, \sum_{i=1}^n a_2^i - a_2^{(i)}, \sum_{i=1}^n a_3^i - a_3^{(i)} \right) \quad (4.3)$$

The experts' revised views are defined in the form of triangular fuzzy numbers following presenting the initial feedback to the experts and taking the second step of Delphi. In this step, as the first step, the experts' average revised opinions  $(B_m^{(i)})$  are calculated through Relation (4.5):

$$\tilde{B}^{(i)} = (b_1^{(i)}, b_2^{(i)}, b_3^{(i)}), \quad i = 1, 2, \dots, n \quad (4.4)$$

$$\tilde{B}_m = (b_{m1}, b_{m2}, b_{m3}) = \left( \sum_{i=1}^n b_1^i, \sum_{i=1}^n b_2^i, \sum_{i=1}^n b_3^i \right) \quad (4.5)$$

There are different methods for the defuzzification of each index's final values. The simple center of gravity method based on Relation (4.6) is used in this study for defuzzification of each of the Delphi steps' values:

$$S_j = \frac{u_j + m_j + l_j}{3} \quad (4.6)$$

The amount of disagreement between experts in two Delphi steps is calculated through Relation (4.7). The repetition of the Delphi steps continues until the extent in which the difference of the experts' views among the two Delphi stages reaches less than the very low threshold (0.2), and consequently, the survey process will be stopped in this case:

$$s(\tilde{B}_m, \tilde{A}_m) = \left| \frac{1}{3} [(b_{m1}, b_{m2}, b_{m3}) - (a_{m1}, a_{m2}, a_{m3})] \right| \quad (4.7)$$

Due to the subject broadness and its dimensions, the stages of its development should be identified based on collective wisdom. Therefore, the fuzzy Delphi method was used accompanied by the content analysis method to achieve some results close to reality by using fuzzy numbers instead of definite numbers in addition to effective communication with the experts of small and medium manufacturing companies and quick access to consensus among their reviews.

The first stage: Delphi questionnaire distribution among experts and computation of the average of each index:

Table 2: The results of the first stage survey and calculation of the average

Row	Index	The average comments of the first stage
1	Professional expertise	2.33
2	Observing justice in the organization	2.42
3	Commitment to reduce jobs injuries	3.58
4	Human dignity Preservation	3.92
5	Protecting the employees' rights in terms of training and promotion	3.50
⋮	⋮	⋮
22	Observing the competency principle	3.58
23	Employees' psychological strengthening	4.00

### The second stage:

Delphi questionnaire distribution with 23 factors among experts accompanied with each index at the first stage and scored given by the expert at the previous stage. The average of each has been computed following data collection



Table 3: The results of the second stage survey and calculation of the average difference between the first and second stages of Delphi

Row	index	The average comments of the first stage	The average comments of the second stage	The average difference between the first and the second stage
1	Professional expertise	2.33	2	0.33
2	Observing justice in the organization	2.42	2.25	0.17
3	Commitment to reduce jobs injuries	3.58	3.79	0.21
4	Human dignity Preservation	3.92	3.9	0.02
5	Protecting the employees' rights in terms of training and promotion	3.50	3.69	0.19
⋮	⋮	⋮	⋮	⋮
22	Observing the competency principle	3.58	3.63	0.05
23	Employees' psychological strengthening	4.00	3.50	0.5

at the second stage, and the average difference is shown at the two stages. The factors with an average difference of less than 0.15 show that they are reached a consensus and omitted from the questionnaire's next stage.

According to the average difference between the second and first stage of experts' views, six factors have reached a consensus of reviews and will not be asked again at the next steps of Delphi.

The third stage 3: the Delphi questionnaire distribution with 17 factors among experts accompanied with the average of each index at the second stage and the score given by the expert in the previous step. The average of each index has been computed following data collection at the third stage, and the average difference between the second and third stages is shown. The factors with an average difference of less than 0.15 show that they are reached a consensus and omitted from the questionnaire's next stage.

Table 4: The results of the third stage survey and calculation of the average difference between the second and third stages of Delphi

Row	index	The average comments of the second stage	The average comments of the third stage	The average difference between the second and third stage
1	Professional expertise	2	1.78	0.22
2	Observing justice in the organization	2.25	2.29	0.04
3	Commitment to reduce jobs injuries	3.79	3.63	0.16
4	Protecting the employees' rights in terms of training and promotion	3.69	3.76	0.07
5	Characteristic traits	4.27	4.36	0.09
⋮	⋮	⋮	⋮	⋮
16	Honesty and realism	3.92	3.83	0.09
17	Employees' psychological strengthening	3.5	3.34	0.16

According to the average difference between the second and third stages of experts' views, seven factors have reached a consensus of reviews and will not be asked again at the next steps of Delphi.

The third stage 4: the Delphi questionnaire distribution with ten factors among experts accompanied by the average of each index at the third stage and the score given by the expert in the previous step. The average of each index has been computed following data collection at the fourth stage, and the average difference between the third and fourth stages is shown. The factors with an average difference of less than 0.15 show that they are reached a consensus and omitted from the questionnaire's next stage.

According to the average difference between the third and fourth stage of experts' views, five factors have reached a consensus of reviews and will not be asked again at the next steps of Delphi.

The third stage 5: the Delphi questionnaire distribution with five factors among experts accompanied with the average of each index at the fourth stage and the score given by the expert in the previous step. The average of each index has been computed following data collection at the fifth stage, and the average difference between the fourth and fifth stages is shown. The factors with an average difference of less than 0.15 show that they are reached a consensus and omitted from the questionnaire's next stage.

According to the difference between the average of the fourth and fifth rounds of experts' views, five factors have reached a consensus of view and will not be questioned again in the next steps of Delphi. Assume that subject  $i$  has a rank equal to  $r_{i,j}$ , in which the index  $j$  shows the number of the referee. On the other hand, we know that there are  $n$  subjects and  $m$  drugs (treatments) in the data set. The sum of all ranks for the  $i$ -th subject is called  $R_i$  and is

Table 5: The results of the fourth stage survey and calculation of the average difference between the third and fourth stages of Delphi

Row	index	The average com- ments of the third stage	The average com- ments of the fourth stage	The average difference between the third and fourth stage
1	Professional expertise	1.78	1.94	0.16
2	Commitment to reduce jobs injuries	3.63	3.57	0.06
3	Organizational morality	4.38	4.19	0.19
4	Perceptual skill	3.68	3.52	0.16
5	Justice and fairness	3.69	3.52	0.17
6	Observance and respect toward social values and norms	2.61	2.61	0
7	Interaction with colleagues	2.69	2.69	0
8	Giving priority to job	2.64	2.66	0.02
9	Transparency in work	2.43	2.66	0.23
10	Employees' psychological strengthening	3.34	3.43	0.09

Table 6: The results of the fifth stage survey and calculation of the average difference between the fourth and fifth stages of Delphi

Row	index	The average com- ments of the third stage	The average com- ments of the fourth stage	The average difference between the third and fourth stage
1	Perceptual skill	1.94	1.94	0
2	Organizational morality	4.19	4.08	0.11
3	Perceptual skill	3.52	3.66	0.14
4	Justice and fairness	3.52	3.66	0.14
5	Transparency in work	2.66	2.56	0.1

computed as follows:

$$R_i = \sum_{j=1}^m r_{i,j} \quad (4.8)$$

The average rate of all the observations is also computed from the following formula:

$$\bar{R} = \frac{1}{n} \sum_{i=1}^n R_i \quad (4.9)$$

For the purpose of calculating the Kendall statistic  $W$ , the sum of the squares of the rank difference has been computed in relation to the average, and it is called  $S$  according to the following relationship:

$$S = \sum_{i=1}^n (R_i - \bar{R})^2 \quad (4.10)$$

Therefore, the statistic of the Kendall  $W$  test will be defined and calculated as follows:

$$W = \frac{12S}{m^2(n^3 - n)} \quad (4.11)$$

Obviously, if all the referees (treatments) have rated the same,  $W$  will be equal to 1, and if there are completely contradictory results in their votes,  $W$  will be equal to zero. Table 7 shows the results of Kendall's correlation coefficient test in different stages of Delphi. The results show that  $W$ . Kendall's coordination coefficient is more than 0.5, and the consensus level among the experts is suitable in all the stages except for the first stage, in which  $W$ . Kendall's coordination coefficient is less than 0.5, and the consensus level among experts is not suitable.

According to the results of the fifth stage of Delphi, the experts reached a consensus for all 23 factors, and there is no need for questionnaire redistribution, and the indexes whose average is less than three are removed at this stage. According to the results, eight factors were eliminated out of 23 indexes, and 15 factors were recognized as mine managers' professional ethics factors with an emphasis on their impact on the employees' mental health, which is presented in Table 8.



Table 7: The results of the of the Kendall's correlation coefficient test

The first stage of Delphi	Number	12
	Kendall's W concordance coefficient	0.442
	Chi-square test statistic	424.101
	Degree of freedom	22
	Significance level	0.000
The second stage of Delphi	Number	12
	Kendall's W concordance coefficient	0.502
	Chi-square test statistic	514.101
	Degree of freedom	22
	Significance level	0.000
The third stage of Delphi	Number	12
	Kendall's W concordance coefficient	0.522
	Chi-square test statistic	518.208
	Degree of freedom	16
	Significance level	0.000
The fourth stage of Delphi	Number	12
	Kendall's W concordance coefficient	0.571
	Chi-square test statistic	523.221
	Degree of freedom	9
	Significance level	0.000
The fifth stage of Delphi	Number	12
	Kendall's W concordance coefficient	0.579
	Chi-square test statistic	524.31
	Degree of freedom	4
	Significance level	0.000

Table 8: The factors of mine managers' professional ethics focusing on its impact on the employees' mental health

Row	The final indexes	Row	The final indexes	Row	The final indexes
1	Characteristic traits	6	Honesty and realism	11	Protecting the employees' rights in terms of training and promotion
2	Perceptual skill	7	Justice and fairness	12	Commitment to reduce jobs injuries
3	Organizational morality	8	Sympathy with others	13	Commitment to the jobs' professional health implementation
4	Commitment	9	Royalty	14	Employees' psychological strengthening
5	Accountability	10	Observing the competency principle	15	human dignity Preservation

### 4.3 Presentation of the pattern for the mine managers' professional ethics factors with an emphasis on its impact on the mine workers' mental health

In this step, the researcher has referred to the experts to rate and present a pattern for the mine managers' professional ethics factors with an emphasis on its impact on the mine workers' mental health, and he has sought to rate the 15 factors identified at the previous stage through presenting a questionnaire. A questionnaire consisting of 15 identified factors according to Table 9 has been used in order to achieve the goal of this step, which asked to determine their relation (absence of relationship, existence determine the one-way relationship, the existence of mutual relationship) by pairwise comparisons.

It is time to enter these variables in the self-interaction structural matrix (SSIM) following the identification of the variables. The group decision rule for collective consensus on the existence of a relationship between any pair of elements, such as A and B, should be specified. Interpretive Structural Modeling (ISM) logic works according to non-parametric methods and is based on mode in frequencies. The achievement matrix is obtained by converting the self-interaction structural matrix into a two-valued matrix of zero and one. The matrix's internal consistency must be established following the initial achievement matrix is obtained. One of the possible strategies to calculate different paths from i to j is to access the T matrix. The achievement matrix T is adapted using the following Boolean rules:

$$\begin{aligned}
 0 + 0 &= 0 \\
 0 + 1 &= 1; \quad 1 + 0 = 1 \\
 1 + 1 &= 1
 \end{aligned}
 \tag{4.12}$$

So, the achievement matrix T is computed as follows:

$$T = (I + D)^{n-1}; \quad t_{ij} = \begin{cases} 1, & \text{If there is a path of variable 1 to variable 2} \\ 0, & \text{otherwise.} \end{cases}
 \tag{4.13}$$

Table 9: Coding the factors of mine managers’ professional ethics with an emphasis on its impact on employees’ mental health

Row	mine managers’ professional ethics emphasizing its impact on mine workers’ mental health	Symbol
1	Characteristic traits	C1
2	Perceptual skill	C2
3	Organizational morality	C3
4	Commitment	C4
5	Accountability	C5
6	Honesty and realism	C6
7	Justice and fairness	C7
8	Sympathy with others	C8
9	Royalty	C9
10	Observing the competency principle	C10
11	Protecting the employees’ rights in terms of training and promotion	C11
12	Commitment to reduce jobs injuries	C12
13	Commitment to the jobs’ professional health implementation	C13
14	Employees’ psychological strengthening	C14
15	Human dignity Preservation	C15

The set of outputs and the set of inputs for each criterion should be extracted from the received matrix for determining the relationships and rating of the criteria. The set of outputs includes the criterion itself and the criteria by which they are affected. The initial achievement matrix was first formed using the return questionnaire (ISM model), and a self-interaction matrix based on the maximum frequency and its relevant information is shown in Table 10.

Table 10: The Initial acquisition matrix

	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15
C1		V	V	V	V	V	V	V	V	V	V	V	V	V	V
C2			V	V	V	V	V	V	V	V	V	V	V	V	V
C3				V	V	V	X	X	X	X	X	X	X	V	V
C4					V	A	A	V	X	A	A	X	X	A	A
C5						V	V	V	A	V	V	V	V	V	V
C6							X	O	O	A	O	O	O	V	V
C7								X	V	V	V	V	V	V	V
C8									X	O	O	O	O	V	V
C9										A	A	A	A	A	A
C10											V	V	V	V	V
C11												O	O	V	V
C12													X	V	V
C13														V	V
C14															A
C15															

The research’s final achievement matrix has been obtained based on the extracted data from Table 10 and passing the way of conducting ISM, which is fully observable in Table 11.

Table 11: The final acquisition matrix

	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15
C1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
C2	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1
C3	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1
C4	0	0	1*	1	1	1*	1*	1	1	1*	1*	1	1	1*	1*
C5	0	0	1*	1*	1	1	1	1	1*	1	1	1	1	1	1
C6	0	0	1*	1	1*	1	1	1*	1*	1*	1*	1*	1*	1	1
C7	0	0	1	1	1*	1	1	1	1	1	1	1	1	1	1
C8	0	0	1	1*	1*	1*	1	1	1	1*	1*	1*	1*	1	1
C9	0	0	1	1*	1	1*	1*	1	1	1*	1*	1*	1*	1*	1*
C10	0	0	1	1	1*	1	1*	1*	1	1	1	1	1	1	1
C11	0	0	1	1*	1*	1*	1*	1*	1	1*	1	1*	1*	1	1
C12	0	0	1	1	1*	1*	1*	1*	1	1*	1*	1	1	1	1
C13	0	0	1	1	1*	1*	1*	1*	1	1*	1*	1	1	1	1
C14	0	0	1*	1	1*	0	0	1*	1	0	0	1*	1*	1	0
C15	0	0	1*	1	1*	0	0	1*	1	0	0	1*	1*	1	1

Dimensions level determination: It is necessary to identify an achievable, prior, and common set, which is specified in Table 12, in order to determine the dimensions level according to what is mentioned in the previous step.

Table 12: Model's levels determination

symbol	Factor	Achievement set	Prior set	Common set	level
C1	Characteristic traits	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	1	1	Fifth
C2	Perceptual skill	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	1, 2	2	Fourth
C3	Organizational morality	3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	First
C4	Commitment	3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	First
C5	Accountability	3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	First
C6	Honesty and realism	3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13	3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13	Third
C7	Justice and fairness	3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13	3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13	Third
C8	Sympathy with others	3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	First
C9	Royalty	3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	First
C10	Observing the competency principle	3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13	3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13	Third
C11	Protecting the employees' rights in terms of training and promotion	3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13	3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13	Third
C12	Commitment to reduce jobs injuries	3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	First
C13	Commitment to the jobs' professional health implementation	3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	First
C14	Employees' psychological strengthening	3, 4, 5, 8, 9, 12, 13, 14	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	3, 4, 5, 8, 9, 12, 13, 14	First
C15	human dignity Preservation	3, 4, 5, 8, 9, 12, 13, 14, 15	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15	3, 4, 5, 8, 9, 12, 13, 15	second

Drawing the interpretive structural model: According to Table 12, the factors including organizational morality, commitment, accountability, sympathy with others, loyalty, commitment to reduce occupational injuries, commitment to the implementation of jobs' professional health, and employees' psychological strengthening at level number one and as the most impressionable factors of the mine managers' professional ethics were identified with an emphasis on the mine workers' mental health. The characteristic features factor was identified at the fifth level and as the most influential factor of the mine managers' professional ethics with an emphasis on its impact on the mine workers' mental health. The perceptual skill factor was also ranked at the fourth level, and the other factors, including honesty and truthfulness, justice and fairness, competency principle observance, and protecting the employees' rights in training and promotion topics, were placed at the third level. The human dignity preservation factor was also placed on the second level. The interpretive structural model has been drawn in Figure 1 according to the specified levels.

#### 4.4 The factors position analysis using MICMAC

- The first area (influential): It includes the variables that have the most influential and the least impressionability level. These variables have a great impact on the system mobility and determine the system behavior. Their impact on other factors of the mine managers' professional ethics, focusing on its impact on the mine workers' mental health, can also be expected through a proper plan for these variables. These factors include personality traits and perceptive skills. These variables' probable state determines the probable state of many other variables affecting the mine managers' professional ethics with an emphasis on its impact on the mine workers' mental health in Iran in the future. Hence, these factors play a decisive role in the scenario planning process. Therefore, these variables can be considered decisive or influential.
- In the second area (two-sided), these variables are factors that have a high influence and impressionability. These factors are also called two-sided. Two-sided factors more or less influence this system's mobility and stability. These factors are divided into two categories, including risk and target variables. The risk variables

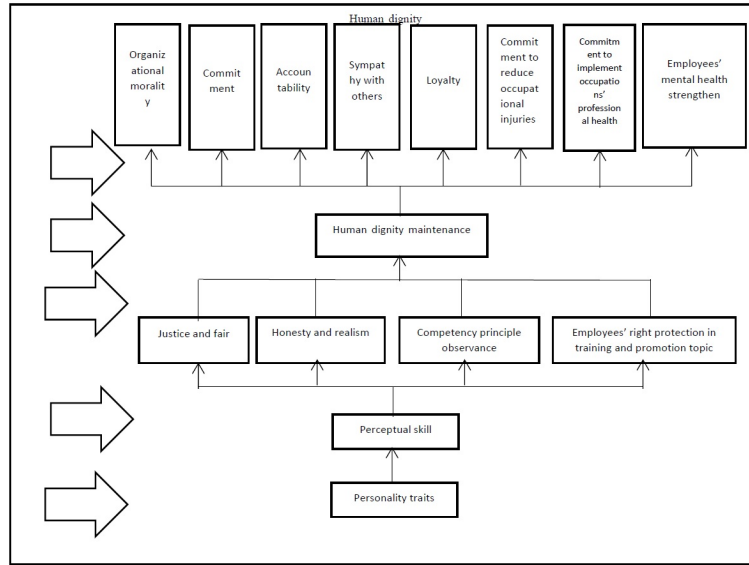


Figure 1: Rating the final factors and pattern

are in the northeast diagonal line area and have a high capacity to become key players, which was not present in this study. The second group in this area is target variables. The target variables are located under the diagonal line of this area. These variables are the evolutionary results of the system whose influence is more than their impressionability and represent the possible goals in the system, and the desired goals in the system can be achieved by proper planning through them. These factors in this research include organizational morality, commitment, justice, and fairness.

- The third area (dependent variables): The factors of this axis are located in the southeast area and have a low influence and a high impressionability rate. Therefore, these variables are named impressionable, which have a decisive role in the mine managers' professional ethics condition by emphasizing its impact on mine workers' mental health in the future. This group includes accountability, honesty and realism, sympathy with others, loyalty, the competency principle observance, maintenance of the employees' rights in terms of training and promotion, commitment to reduce occupational injuries, commitment to the implementation of occupational health, the employees' psychological strengthening and human dignity maintenance.
- The fourth area (independent variables): variables in this diagram have a low level of influence and impressionability and are located in the southwest part of the diagram. These variables imply the processes which include very few changes. In fact, these variables act independently. The independent factors are divided into two categories, including the result factors and secondary leverage. They are close to the coordinate axis regardless of the result, and they have less influence and impressionability level in the system, according to the experts. None of the agents of this study are existed in this area.

## 5 Discussion and conclusion

The human resources problem and the conditions governing it in the mining and mining industries sector have faced many challenges and problems more than all fields, which can only be modified through proper planning and changing the attitude of policymakers and business owners in this field. The human resources deficiencies are most noticeable in the mines field due to the relatively traditional view toward activities in mines and the neglect of planning and development of the necessary infrastructure on the one hand and the non-compliance with professional ethics by managers in this field on the other hand. The human resources category in the current era needs basic and fundamental changes in the way and kind of attitude towards it. The human resources issue requires a paradigm conversion from traditional and administrative approaches to human approaches. The generational change and the change in the preferences of the future generation who will enter the labor market in the following decade is one of the most fundamental issues that make structural reform in human resources management inevitable. New generations have new preferences and definitions of jobs in their minds, and the adaptation of human resource structures to them can guarantee the companies' success and progress. It should also be stated that productivity is a principle that

includes all economic sectors, and no effort will be successful without it. Since productivity in the mining sector is also considered an important factor, any action in the mining area should be based on improving the specialized manpower's mental and psychological conditions. Mine managers should focus on the issue of human resources and professional ethics observance to reach the most profit and the least costs. Mines, which are called large economic enterprises, can take action to create value for themselves by improving the managers' professional ethics on the one hand, employing a young and talented workforce, and investing in the development and training of their competencies and talents on the other hand. Certainly, the succession category and the necessity to improve the employees' commitment are very important in such large companies. This group of large economic enterprises needs to maintain and establish long-term and continuous communication with their human capital, considering the long path and long-term goals defined in front of them through which they can manage and reduce the human capital shortage risk by obtaining the employees' commitment.

This research was firstly tried to investigate the managers' professional ethics factors. In the research's second step, the experts' desired data was extracted using the Delphi method; from the 23 factors extracted in the first step (content analysis), eight factors whose average quorum was less than three were removed from the mentioned factors, and 23 factors was recognized as the mine managers' professional ethics factors with an emphasis on its impact on the employees' mental health. The results of the application of the interpretive structural modeling technique show that the managers' personality traits and their perceptive skills should be taken into attention because these factors are the basis of the interpretive structural model. In other words, these factors are important and necessary in their place, and it cannot be said that the appropriate state of mine managers' professional ethics can be predicted with an emphasis on its impact on the employees' mental health without paying special attention to these factors. The senior managers of the ministry and mines and also the senior managers of human resources should keep these two factors (the managers' personality traits in particular as influential factors) in mind as the underlying factors and achieve other positive results and factors by influencing these factors. The factors including organizational morality, commitment, accountability, sympathy with others, loyalty, commitment to reduce occupational injuries, commitment to occupational health implementation, and employees' psychological strengthening were identified at the first level and as the most effective factors of the mine managers' professional ethics with an emphasis on its impact on the mine workers' mental health. Achievement to the highest degree of these eight factors can improve the state of mine managers' professional ethics with an emphasis on its impact on the mine workers' mental health.

According to the results of the presentation of the mine managers' professional ethics model with an emphasis on its impact on the mine workers' mental health, the following suggestions can be given to the managers of the mining industries of Iran:

- Considering that the two factors of managers' personality traits and their perceptual skills constitute the most influential factors (infrastructures of the model) and cannot be changed by the organization, they should be given special attention at the time of appointment and recruitment and they are important factors in the mine managers' selection.
- The factors including perceptive skill, organizational morality, accountability, sympathy with others, commitment to reducing occupational injuries, commitment to occupational health implementation, strengthening the employees' mental health and human dignity maintenance have the highest level of impressionability, and therefore, it is necessary to pay special attention to the mentioned factors to improve the competitive advantage resulting from improving the human resources' productivity enjoying mental health to improve the employees' mental health using the improvement of management based on professional ethics.
- According to the rating presented in the present research's interpretative structural model, we invite the managers to put the institutionalization of the participation charter in the organizational goal on the agenda obviously to realize participatory goal-setting in order to strengthen the factor of justice and fairness according to the effective support in the organization through social relations strengthen within the organization and the employee's job roles clarification through clarifying the guidelines existing in the organization and competency principle observance. The managers should act impartially in the human resources attraction employment, and the job application should be informed correctly and clearly mention the reasons for rejecting people. Some items such as competency principle observance, and lack of rationalism in manpower promotion, observing justice and human values in evaluating their performance, observing certainty and honesty in transmitting information related to the employees' performance, the employees' rights protection in providing training to them and observing honesty and bailment in the expression of the training results, commitment to reducing occupational injuries and honest and fair dealings with employees in order to correct their behavior help managers to improve the mines managers' professional ethics.

- Considering that the most part of the managers' professional ethics factors are located in an area with low influence and high impressionability and they have a decisive role in the mine managers' future professional ethics state with an emphasis on its impact on the mine workers' mental health, the managers and decision-makers of this industry are suggested to pay more attention to the some factors including accountability, honesty and realism, sympathy with others, loyalty, compliance with the principle of merit, maintaining the rights of employees in terms of training and promotion, commitment to reduce occupational injuries, commitment to the occupational health implementation, employees' psychological strengthening and human dignity preservation among all the factors introduced in this research in order to underlies the bright future of Iran's mining industry from the perspective of the managers' professional ethics and the employees' mental health and avoid wasting this fundamental industry's financial resources in Iran.

## References

- [1] A. Amin Bidakhti and A. Mardani, *The relationship between mental health and professional ethics observance among nursing staff*, *Med. Ethics* **9** (2015), no. 31, 49–73.
- [2] N. Amrollahi and Z. Arami Ardakani, *Explanation of the organizational positive events' roles on the employees' mental health (case study: Iranian oil industry expert)*, *Sustain. Human Resource Manag.* **2** (2020), no. 3, 213–231.
- [3] A. Ansari, *Examination of the relationship between organizational intelligence, organizational culture and organizational commitment with the mediation of mental and emotional health among the staff of Tehran municipality*, 7th Nat. Conf. Modern Res. Manag. Econ. Account. Iran, Tehran, 2022.
- [4] A. Asgari and S. Bahmani, *The role of organizational culture in the emergence of teachers' professional ethics*, *Интеграция образования* **26** (2022), no. 1(106), 10–26.
- [5] N.V. Belinova, I.B. Bicheva, O.V. Kolesova, T.G. Khanova and A.V. Khizhnaya, *Features of professional ethics formation of the future teacher*, *Rev. Espac.* **25** (2017), 9–25.
- [6] M. Charkhab, M. Hosseinpour and M. Nasiri, *Provision of a professional ethics environment for future research development*, *Educ. Sci.* **27** (2019), no. 2, 201–224.
- [7] F.A. Chervenak and L.B. McCullough, *Professional ethics and decision making in perinatology*, *Seminars Perinatol.* **46** (2022), no. 3, 151520.
- [8] A. Dehghani, *Factors affecting professional ethics development in students: A qualitative study*, *Nurs. Ethics* **27** (2020), no. 2.
- [9] S. Deh Yadgari, A.A. Ashrafzadeh, E. Shahabi and Z. Soltaninejad, *Investigation of the impact of adherence to professional ethics and human resources agility on organizational crisis management due to Corona crisis in Shahid Bahonar University, Kerman*, Third Int. Conf. Global Challeng. New Sol. Ind. Engin. Manag. Account., Chabahar, Iran, 2022.
- [10] M. Fuchs and M. Schalljo, *'Western' professional ethics challenged by foreign acquisitions: German managers' patterns of interpretation surrounding Chinese and Indian investors*, *Geoforum* **75** (2016), 20–28.
- [11] A. Gorzin Mataei, M. Taqvai Yazdi, and K. Niaz Azari, *Presentation of professional ethics model in higher education institutions of Mazandaran province*, *Jundishapur Educ. Deve. Quart.* **8** (2017), 75–52.
- [12] S. Habibi, M. Salimi, and S.H. Husseini, *Investigation of the effect of ethical components in promoting it among the faculty members of sports science faculties of public and free universities in Tehran province*, *Quart. J. Manage. Leadership Stud. Educ. Organ.* **2** (2022), no. 2, 57–69.
- [13] S. Habibi Reyhan Abadi, A.H. Mohammad Davoudi, and K. Mohammad Khani, *Identifying the factors promoting the professional ethics of school principals with Dematel approach and content analysis*, *Iran. J. Educ. Sociol.* **3** (2020), no. 2, 70–80.
- [14] M. Haj Mohammadi, H. Pour Shafi, M. Zirak, and H. Momeni Mohmui, *Components of professional ethics of school principals: a synthesis of Roberts's model*, *J. Bioeth.* **11** (2021), no. 36, 1–18.
- [15] M.M. Hayai and M. Rizvani Chaman Zamin, *Investigating the relationship between the dimensions of leadership style and mental health of employees in the finance department of Gilan province*, 10th Int. Conf. Manag. Account. Innov. Bus., Tehran, 2022.



- [16] M. Heydari, S.M.H. Razavi, S. Amirnejad, and N. Mohammadi, *Identification of the creation and development obstacles in the sports organizations' professional ethics of managers*, Sci.-Res. Quart. Organ. Behave. Manage. Stud. Sports **6** (2019), no. 3, 23–35.
- [17] Z. Imam Dost, N. Jabari, and K. Niazazri, *Presentation of school managers' perception model of professional ethics challenges in the modern society*, Educ. Sociol. **13** (2020), no. 1, 221–231.
- [18] S. Jafari Rad, M. Ghorban Hosseini, Z. Amini, and M. Rostami Bashmani, *Designing a professional ethics model for managers based on religious sources*, Islamic Life Style **5** (2022), 63–74.
- [19] Z. Kabiri, R. Sabunchi, and N. Aghaei, *Determining the role of social capital in the causal effect of managers' professional ethics on the civic ethics of fans of Iran's first division league clubs*, Sci.-Res. Quart. Appl. Res. Sports Manage. **8** (2020), no. 4, 113–124.
- [20] G. Khaki, *The Research Method with an Approach to Thesis Writing*, Rekasal Publications, 2007.
- [21] D. Kučera, *Challenges of managerial responsibility and ethics for central and east European countries based on the experience from the Czech Republic*, Int. J. Manage. Educ. **20** (2022), no. 2, 100583.
- [22] N. Kurniati, Y. Saftiana, and I. Andriana, *The effect of culture, personality factors, and religiosity on auditor's professional behaviour*, Oblik Finansi **95** (2022), no. 1, 13–21.
- [23] S.A. Mirzaei and M. Garakhani, *Professional ethics of science (study of code of conduct of professional ethics in world scientific associations)*, Iran. J. Soc. Stud. **15** (2021), no. 2.
- [24] M. Mohsenpour, *Evaluation of qualitative data*, Bayhaq **16** (2001), no. 2, 50–55.
- [25] M. Moradi, A. Zare, and F. Vafasefat, *The level of familiarity with the librarians of the libraries related to Astan Quds Razavi with the of the professional ethics criteria of librarianship: a research report*, J. Stud. Library Info. Sci. **11** (2019), no. 3.
- [26] A.A. Muslimpour, M. Moazzami, and N. Bani Asadi, *Presentation the professional competence improvement model of scientific department managers of Islamic Azad University in a qualitative way*, Behav. Stud. Manage. **11** (2020), no. 23, 19–32.
- [27] T. Oduol, *Teacher professional codes of ethics of New Zealand and Kenya: A document analysis*, Int. J. Educ. Res. **8** (2020), no. 12, 147–162.
- [28] H. Rafiei Beldaji, H. Maleki, and A. Khorsandi Taskoh, *Identifying and prioritizing the components of professional ethics of the faculty members of the faculty of psychology and educational sciences of Allameh Tabatabai University from the point of view of professors and students*, Manag. Islamic Univer. **8** (2018), no. 1.
- [29] A. Rezaloui and G. Mahdavi, *Investigating the impact of conformity and obedience pressures on financial managers' unethical decision-making emphasizing the moderating role of individual characteristics*, J. Value Behave. Account. **5** (2020), no. 9, 81–115.
- [30] Y. Safari, A. Khatony, E. Khodamoradi and M. Rezaei, *The role of hidden curriculum in the formation of professional ethics in Iranian medical students: A qualitative study*, J. Educ. Health Promot. **9** (2020), 180.
- [31] E. Stratton, A. Lampit, I. Choi, R.A. Calvo, S.B. Harvey, and N. Glozier, *Effectiveness of eHealth interventions for reducing mental health conditions in employees: A systematic review and meta-analysis*, PLoS ONE, **12** (2017), no. 12, p. e0189904.
- [32] A.M. Winfield Reyes, C. Topete Barrera, and F.N. Winfield Reyes, *Values and professional ethics in the leadership management of directors of educational organizations*, Int. J. Innov. Educ. Res. **7** (2019), no. 3, 40–55.
- [33] S. Youssefi, R. Abadi, A. Gol Afshani, and T. Bahu Torodi, *Investigation of the relationship between emotional intelligence and mental health of education employees, district 2, Sari city*, Process. Engin. Mag. **5** (2018), no. 11, 80–95.