

## Assessing vulnerability caused by earthquakes using RADIUS model, multi-criteria decision making systems and GIS (case study of Yazd city)

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### Introduction

The occurrence of severe earthquakes has prompted mankind to think of developing an infrastructure program to reduce the risks and damages caused by it. The purpose of this research is to investigate the damages caused by the earthquake in Yazd using the RADIUS model and the hierarchical analysis process in the GIS environment in the proposed scenarios.

According to the United Nations report, in 2003, Iran ranked first among countries in the world in the number of earthquakes with an intensity greater than 5.5 on the Richter scale and one of the highest ranks in terms of vulnerability to earthquakes and the number of people killed. As a result of this phenomenon, [4].

The country of Iran with seismic vulnerability of certain groups of constructions such as: public buildings with non-reinforced construction materials, old densely populated buildings in urban centers, dilapidated structures, residential houses and concrete structures that were built in the 1960s. Until 1980, they faced poor design and materials [1]. Cities are places of population gathering and increasing environmental and economic loads, the existence of this important issue raises the need to reduce vulnerability to earthquakes.

According to the earthquake risk zoning map of Iran, the city of Yazd is located in a zone with a relatively low risk, however, due to the existence of

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earthquake faults in the province that can affect this area and the city of Yazd. Assessing its vulnerability using effective and appropriate models is one of the essentials of urban crisis management. It should be stated that the research that has been done in relation to earthquake and its risk assessment has mostly examined the earthquake in the city with spatial data and based on multi-criteria decision-making models and about buildings, but in this research, the combination of RADIUS and AHP models. Used. So far, many analyzes and evaluations have been carried out in connection with damage estimation and earthquake vulnerability assessment, each of which has used multiple models and methods according to goals and assumptions.

### **Materials and methods**

The type of research in this study is applied and the research method is qualitative-analytical. The data collection for this research is mainly based on field observations, including the collection of the desired features about the city's structural and physical features, and in the form of a library, including the use of 1:2000 city maps and satellite images to update the maps and also use From the available statistics and information related to the subject of research, it has been done. The data used in this research includes population density, road network, number of floors, slope, position relative to the fault, type of structure and age of the building, ArcGIS and RADIUS software were used.

### **Discussion and results**

#### **The results of damage estimation due to earthquake in Yazd city**

To estimate the damage caused by the earthquake in Yazd city using AHP and TOPSIS models, initially RADIUS model was used to design the earthquake scenario and calculate the intensity of the earthquake in different parts of the region, to calculate the intensity of the earthquake in different parts of the region, Yazd city to The equal network, 2000 meters by 2000 meters, the division and the information required by the program, separately for each network, entered the software.

Estimating the vulnerability of buildings and their distribution in the region based on the scenario of the Anar fault.

The results indicate that 21% of cities will suffer heavy damage, 31% will suffer significant damage, 33% will suffer moderate damage, and 27% will suffer low damage. The most damage is related to area two and part of area one. Another problem of these types of tissues is their inappropriate and limited access, which makes it difficult to provide relief. The least amount of damage is related to the third area.

Estimation of the vulnerability of buildings and their distribution in the region based on the Mehriz Taft fault scenario

The amount of damage in this scenario is higher than the previous scenario. The results indicate that 38% of the city will suffer heavy damage, 32% will suffer significant damage, 20% of the city will suffer moderate damage, and 11% of the city will suffer low damage. Most of the damage is related to area two and a part of area one.

### **Conclusion**

One of the most important concerns of city officials is reducing the effects of earthquakes among city residents and urban environments, both before and after its occurrence. In this regard, it is essential to identify urban areas vulnerable to earthquakes.

Examining the results of the earthquake damage estimation in the study area based on the two developed scenarios, indicates that the most damage to the area will be caused by the Mehriz-Teft fault in the area. According to the indicators and models used during the earthquake, the most vulnerable area will be the two-city area of Yazd.

Due to the fact that the city of Yazd has the possibility of facing an earthquake due to its geographical location and existing faults, and in the meantime due to the existence of many faults near and inside the city, the vulnerability of this city to the risk of earthquake increases. Another case is the presence of old and automobile structures in the two cities of Yazd, which have little stability against earthquakes, and another problem is their inadequate and limited access, which makes it difficult to provide relief to their residents after an earthquake and can become critical. The situation provoked a human disaster.

**Keywords:** vulnerability, earthquake, RADIUS model, Yazd city.

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## Iran's legal non-penal criminal policy regarding the creation of environmental hazards

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### Introduction

Environmental hazards, whether they occur naturally and outside of human actions, or with the intervention of humans and their actions, cause extensive damage to human society every year and cause irreparable damage to the human environment. From severe earthquakes and devastating floods to climate and weather changes and dust and drought phenomena, it has left irreparable environmental damage, especially in the Far East. In addition to that man-made hazards such as polluting the environment through the production of pollutants, unprincipled production of waste, destroying forests and pastures with unprincipled actions in them, polluting rivers and seas and beaches by importing industrial waste or oil and gases. Extraction, manipulating the ecological cycle through the construction of unnecessary dams or changing the course of rivers, followed by the destruction of thousands of hectares of forests and natural resources and the destruction of many generations of animals and plants, have brought the human environment to a stage that It has minimized the possibility of human life to continue with security and peace. As a result, every year a significant number of malformed babies are born and a larger number die due to the occurrence of diseases caused by the above situation, but some of the citizens continue their lives with diseases caused by the current unfavorable environmental situation.

The question is, what should be done to deal with the above risks and to avoid its deadly effects, and what solutions have been provided by the country's current laws and regulations in this regard?

In this article, taking a look at Iran's strategic policy in the constitution, the solutions to prevent related risk crises are reviewed.

### Research Method

Considering that the purpose of the current research is to increase understanding and knowledge in the field of dealing with environmental hazards and non-criminal prevention of these hazards in Iran's criminal policy, therefore, in this regard, the current research is of an applied type and by explaining the scope of the non-criminal measures mentioned in The laws in question seek to answer the

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question, what is Iran's non-criminal criminal policy against dangerous and crisis-causing behaviors that create or exacerbate environmental hazards? And in this context, by using library tools and referring to the relevant laws, the legislative measures of Iran's legislator in the criminal policy of dealing with environmental hazards have been examined.

### **Conclusion**

Through the conducted studies, it has been found that although significant measures have been provided in the relevant laws to deal with environmental hazards, the legislator has paid less attention to social prevention measures that promote public culture to deal with these hazards. In this regard, it seems that considering the place of criminal prevention and its effectiveness in the society, it is necessary for the legislator to pay special attention to social prevention and raising public culture in order to deal with environmental hazards by passing appropriate laws.

**Keywords:** legislative criminal policy, non-criminal, environmental hazards, social prevention, situational prevention.

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**Providing a qualitative model for educating citizens in  
environmental hazards based on grand theory  
(Case Study: major fires)**

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**Abstract**

The tragedy of the high-rise Plasco building's collapse in the center of Tehran, not only the citizens of this city, but all the people of Iran were shocked. although what happened is not comparable to the dimensions of the September 11 disaster in New York, but in terms of the shape and the way the building collapsed, it evoked the same terrible and amazing condition in the world's public opinion. In this regard, it is expected that the damage of this accident can be reduced by educating the citizens.

On this subject, the aim of the current research is to provide a model for educating citizens in environmental hazards (big fire crises) [4] based on the ground theory. Quantitative development of research activities in knowledge-based and developed societies is a permanent and continuous process, and diversity in different research methods requires a new approach of research methods and models. Therefore, the current research approach is qualitative. The current research tool is an interview that was collected from an elite panel. The results show that the most important extracted categories are the innovation of education and prevention [1] development conditions, participation, educational activities, effectiveness of training courses in big fire [3] and its consequences. Designing a comprehensive public education plan is a collaborative process, the result of which can be seen in the existence of a documented fire control and protection system. Public citizenship education [2] and increasing people's awareness through short-term citizenship education, education through public media such as radio, television, newspapers and local brochures can be the most important aspect of fire prevention activities.

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**Keyword:** hazards education, major fire crises, ground theory, Environmental hazards.

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## **Analysis and prediction of time distribution of road accidents in Karaj-Qazvin freeway**

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### **Introduction**

Humans face danger in some way every day, preventing environmental hazards and effectively dealing with them as traumatic events is one of the most important concerns of policymakers and executives in various areas of social issues [3]. One of the most important risks are traffic accidents and humans have always been looking for a solution to reduce or at least control the risks in their lives. Among the types of accidents, road accidents are one of the most important causes of death and serious injuries [4]. The cost of accidents on the country's roads is very high, and one of the most effective ways to reduce accidents, violations and increase safety in driving is to accurately identify the parameters that affect accidents and measure their effectiveness, the results of which can be provided to the responsible organizations in order to increase The safety level on the roads should be used to reduce accidents [1,2].

Therefore, the purpose of this research is to analyze and predict the time distribution of road accidents, of course, considering the extent and diversity of the country's roads, this research is done on one of the important roads that is the connecting bridge between Tehran and Qazvin cities. So, considering the importance of this axis and of course the need to obtain correct information at the right time for better decision-making, the achievement of this research is to obtain the temporal pattern of the occurrence of road accidents on the Karaj-Qazvin freeway, so that by predicting the relative time of the occurrence of accidents, it is possible to plan to provide the correct measures to reduce the costs caused by accidents to some extent.

To achieve this goal, two basic questions are raised: What is the temporal distribution of road accidents in the Karaj-Qazvin axis? Is it possible to find a pattern between the season, day and time of occurrence of road accidents and

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will this pattern be able to predict the possible time of occurrence of road accidents in the studied axis?

Karaj-Qazvin freeway is one of the two connecting roads between Qazvin and Tehran, which is used by cars, especially passenger cars, more than the old road due to its freeway and relative safety conditions. And it is one of the main traffic routes in Qazvin province.

### **Materials and methods**

In terms of objectives, this research is classified as applied research, and from the perspective of interpretation and analysis of findings, it is descriptive-analytical, the general approach to this research is quantitative, and based on data mining and pattern finding techniques based on J48 algorithm of Weka software, that it is one of the simplest and perhaps the most widely used data mining software for preparing the decision tree, so first the statistical data of road accidents from the reports of the traffic police, at the provincial level in the desired axis, were collected and based on the process of data analysis and data mining and by CRISP technique has been analyzed in 6 stages of data.

The main reason for using this technique is the large amount of information that puts it in the category of big data, and therefore we have had to use data mining techniques to analyze this type and volume of data. Of course, before entering the data into the data mining software, in order to ensure the existence of a relationship and correlation between the time variables of this research (season, time and day of the occurrence of road accidents), these variables were nominal from the correlation test of nominal variables, lambda coefficient is used, data related to road accidents were extracted from the data contained in the traffic police report form during the years 2019-2020 on the Karaj-Qazvin highway.

### **Discussion and results**

In this article, accident data has been analyzed based on the day, season, and time of the accident:

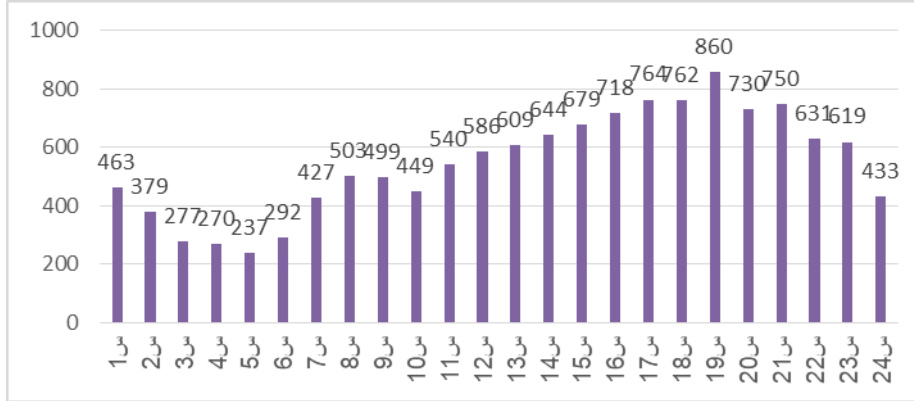


Fig. 1. Time of occurrence of road accidents in Karaj Qazvin Freeway during 2010-2019

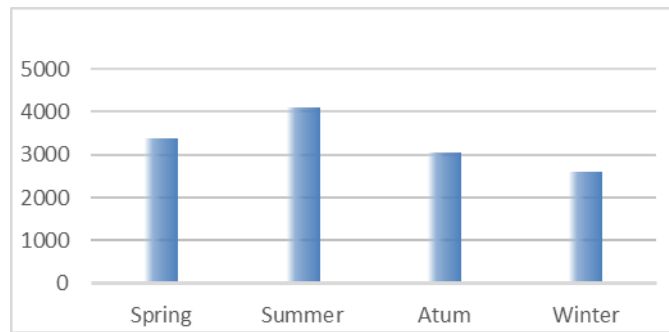


Fig. 2. The occurrence of accidents in different seasons during the years 2010-2019 on the Karaj-Qazvin freeway.

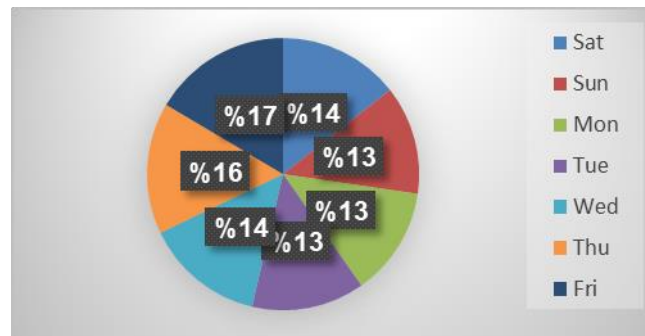


Fig. 3. The occurrence of accidents based on days of the week on the Karaj-Qazvin freeway

Considering the above figures, can be concluded that most of the accidents on the Karaj-Qazvin freeway occurred at 19-21 hours, in the spring and summer seasons, and the accidents had a relatively equal distribution among the days of the week, but on Thursdays and Fridays, according to The location of this freeway and the connection of Tehran to the northern cities, and the possibility of congestion on weekends due to the increase in trips, can be justified.

In order to ensure the temporal relationship of accidents with each other on the Karaj-Qazvin freeway, the correlation coefficient test has been used, of course, considering that the main variables here (season, day, and hour) are all nominal variables, so The correlation test of nominal variables (lambda coefficient) is used here, the sig calculated for all three variables is less than 0.05 and with 95% confidence, the correlation and relationship of these three variables can be confirmed. In the following, the decision tree and prediction model of the purpose of this research is drawn by the data mining software Weka (J48 algorithm) in the form of Figure 4.

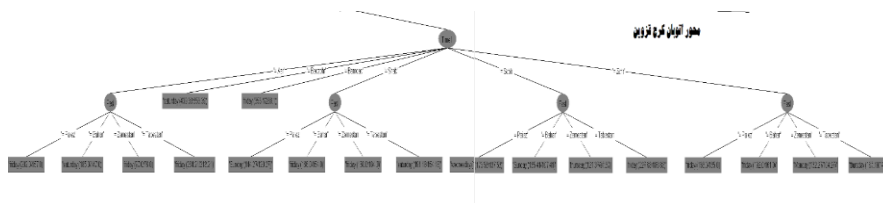


Fig. 4. Prediction tree and time pattern of road accidents in Karaj-Qazvin freeway

In the model presented in Figure 4, the probability of road accidents on the Karaj-Qazvin freeway, the relationship between the three variables of the time of the accidents, and then the seasons and finally the days of the week are analyzed. This model will actually help in predicting the time of road accidents on the Karaj-Qazvin freeway.

### Conclusion

The results of the analysis of the branches in Figure 4 showed that: on the Karaj-Qazvin highway, in the early morning hours, which is, between 24:00 and 4:00 in the early morning, in all seasons of the year (spring, summer, autumn and winter), the probability of road accidents on Fridays is higher than other days of the week.

But in the morning hours, between 4 and 11 am: in the spring season: Sundays, in the summer season: Fridays, in the fall season: Wednesdays, and in the winter season: Thursdays; the probability of road accidents is much higher than other days. Also, during the noon hours, that is, between 11:00 and 15:00 in the spring and autumn: the probability of road accidents on Fridays is higher than on other days of the week. In the summer season: this possibility on

Thursdays and in the winter season on Mondays every week; the possibility of road accidents on Karaj-Qazvin highway will be more than other days.

In the afternoon between 15:00 and 17:00: in all seasons (summer, autumn and winter), the probability of road accidents on Saturdays will be higher than on other days of the week. In the evening hours between 17:00 and 19:00 in the summer, autumn and winter seasons (three consecutive seasons of the year): the possibility of road accidents on Fridays and in spring (the first season of the year) the possibility of road accidents on Saturdays more than others it will be the days of the week.

And also during the night hours between 19:00 and 24:00 in the spring and winter seasons: the possibility of road accidents on Fridays, in the autumn season: on Sundays and in the summer season: on Saturdays; the probability of road accidents will be higher.

**Keywords:** Road accidents, data mining, accident prediction, decision tree, Karaj-Qazvin axis.

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**Spatial analysis of the amount of landslides using radar  
interferometric technique in order to reduce hazards  
(Study area: Sarbaz area in Isfahan province)**

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### **Introduction**

Landslides are one of the most complex and at the same time harmful phenomena, as a result of which the slope material is moved from the sloping surfaces and relatively deep wounds are left on the surface of the slopes. A phenomenon near cultural features, such as residential areas, roads, etc., causes financial damage and many casualties. The use of geographic information systems in the first place, followed by the use of satellite image analysis technology, is of great help to this part of management. For this purpose, the D-InSAR radar interferometry technique, with its frequent, continuous wide ground coverage and high temporal and spatial resolution, as one of the most accurate and least expensive remote sensing techniques, to display the displacements that occur in the ground surface is provided. The present study investigated the existence of landslides in the study area of Sarbaz village by means of Sentinel 1 sensor radar images and using radar interferometric technique in the period of 2017 and 2018. After various processes that were done in ENVI software and SarScape plugin, the amount of displacement and landslide of the area was obtained, and according to the results obtained, it can be said that Sarbaz area is an area with a high level of activity in terms of landslides. Also, 3 points have been introduced as points with high sensitivity, which were found to be in the medium to high risk level. The obtained results showed that Sarbaz region had a displacement of -0.069 in the period of 06/05/2017 to 12/14/2017, in fact it had a displacement of nearly 7 cm, in the period of 12/14/2017 to 12 In 06/2018, the amount of displacement was -0.035, which means that nearly 4 centimeters of displacement occurred in the region, and between 12/06/2018 and 21/12/2018, the displacement in the region was

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equal to  $-0.064$ , which It shows that there has been 6 cm displacement in the studied area during this time period. At the end, a map of sensitive points was prepared and presented.

Deformation of the soil surface is a dynamic process on the Earth's surface, this process occurs naturally or due to human intervention. One of the forms of this deformation is landslide [7]. The definition of landslide is the general and deep movements of the entire soil layer on the surface of the mother earth, which cause heavy damages every year, sometimes it is not possible to compensate for these damages, and we need to spend a lot of time and money. The speed of their operation and their extent often creates spectacular and sometimes catastrophic phenomena, and they may affect tens or hundreds of thousands of cubic meters of rock and soil in one place. This phenomenon works mostly in isolated sediments [10]. The effects of domain instability are mass movements on a small to large scale. Range movements may be minor and unique to the fall of a single piece of rock, or they may be very large and catastrophic. The damage caused by this type of movement is more in developed countries, but 95% of the deaths caused by it happen in developing countries. Landslides are among the most devastating natural disasters in steep areas, the damage to residential areas and economic infrastructure, as well as human casualties caused by landslides are increasing worldwide [9]. Iran, with its mainly mountainous topography, tectonic activity and high seismicity, diverse geological and climatic conditions, has the main natural conditions for creating a wide range of landslides [4]. By using morphotectonic indicators, it is possible to help planners by providing maps in predicting the places that will become unstable due to future earthquakes. By using morphometric analysis and using geomorphic indices and rank parameters of drainage networks, the active tectonics of a region can be investigated [5]. Among the presented methods, we can mention tachometry, leveling, short-range photogrammetry, observations from geodetic networks [GPS], radar interferometry, and lidar. Although the first use of radar data in investigating the instability of the earth dates back to the mid-1990s, in recent decades, due to the availability of radar data with a long time span compared to the past, and the development and expansion of new methods such as techniques Interferometry has drawn the attention of researchers to the use of these methods [4]. Among the remote sensing techniques, differential radar interferometry [DINSAR], which has the ability to work in all bad weather conditions and the length of day and night, is considered as one of the effective and efficient techniques in monitoring slow changes in the earth's surface [11]. Due to the fact that natural phenomena and hazards will cause damage in different regions, therefore, it is important and necessary to investigate these issues in different time frames and regions in the country. This research was conducted for the first time in the studied region. and the purpose of doing it is to investigate the amount of landslides in Sarbaz village in Isfahan

province using radar satellite images, remote sensing techniques and radar interferometry. Therefore, this research is innovative in terms of being new and up-to-date.

### **Materials and methods**

In the current research, in order to monitor and determine the amount of displacement caused by the movement of the sliding mass of Sarbaz village, the radar interferometric method and Sentinel-1, radar satellite images with C-band wavelength in the ascending orbit mode have been used. Radar interferometry or interferometry is the method of using the phase difference of signals returned from the earth's surface in two SAR images taken with a time delay or with parallax from a region to extract height or information related to changes in the earth's surface. In order to implement the DInSAR method, one should first pay attention to two principles between each pair of radar images (main image and secondary image), the first is the temporal baseline and the second is the spatial baseline. After choosing suitable interferometer pairs based on temporal and spatial baselines, in the next step of processing these images, and in order to remove the topography effect from the interferometer, the method of preparing the interferometer along with the digital height model was used. The output of this stage of the work is in the form of a differential interferogram in the form of a flattened interferogram in which the stationary phase and the topographic phase are removed from the interferogram. Since the flattened interferometer contains noise that lowers the visual quality of the fringes, the adaptive filter is used for this purpose.

### **Discussion and Results**

Identifying areas prone to landslides and zoning the potential of landslides is very necessary and important in order to avoid these areas and implement prevention and control methods. In order to implement the DINSAR method in this research, the capabilities and quality of the radar images used to prepare the interferometer were checked by calculating their temporal and spatial baseline values.

The amount of displacement in these maps is shown in the form of a numerical range between negative values and positive values in meters (Figure 2). The level of the range and slopes and positive values indicate the accumulation of sediments at the foot of the range and slopes. According to the maps of phase transformation to displacement of the landslide and the analysis of images in different time intervals, the metamorphosis of the landslide surface can also be explained well.

Table 1. The results of numerical processing of landslides and accumulation of sediments

Image	Image date	The direction of the satellite	Time interval of two images (Day)	Baseline (Meter)	displacement (centimeter)	General displacement (centimeter)
1	05/06/2017	Ascending	192	123,689	Accumulation of sediments 1.6	8.6
	14/12/2017	Ascending				
2	14/12/2017	Ascending	180	75,574	Accumulation of sediments 5	8.5
	12/06/2018	Ascending				
3	12/06/2018	Ascending	192	98,088	Accumulation of sediments 2.2	8.6
	21/12/2018	Ascending				

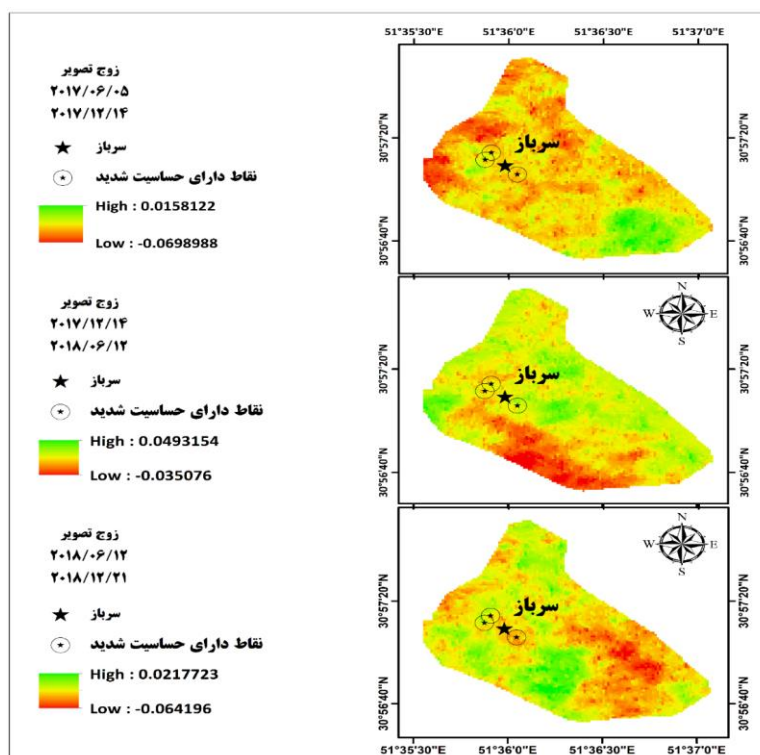


Fig. 1. General map of landslides and accumulation of sediments



According to the results obtained and determining the amount of landslides in the region, we have reached a positive correlation with the results of similar works, according to the results of similar works in the field of landslides that Sadeghi et al. (2022), Casagli et al. (2016), Hammand et al.(2019), Deming et al.(2020), it is concluded that by using remote sensing and radar interferometric technique, the amount of landslides in different areas can be determined with high accuracy and low cost. achieved and provided the results to relevant authorities to provide appropriate solutions.

### Conclusion

In the new decade, the use of new technologies in the field of urban management as well as natural disaster management has had a growing trend. The use of geographic information systems in the first place, followed by the use of satellite image analysis technology, is of great help to this part of management. The present study calculated amount of landslides in Sarbaz village in Semiram city of Isfahan province by using Sentinel 1 radar satellite data and with radar interferometric technique. It is caused by landslides or, on a smaller scale, human activities. Negative numbers and sections indicate falls on slopes and other areas. According to the obtained results, it can be said that Sarzab region is an area with a high level of landslide activity. Also, 3 points have been introduced as high sensitivity points, which were found to be in the medium to high risk level. The obtained results showed that Sarbaz region had a displacement of -0.069 in the period of 06/05/2017 to 12/14/2017, in fact it had a displacement of nearly 7 cm, in the period of 12/14/2017 to 12 In 06/2018, the amount of displacement was -0.035, which means that nearly 4 centimeters of displacement occurred in the region, and between 12/06/2018 and 21/12/2018, the displacement in the region was equal to -0.064, which It shows that there has been 6 cm displacement in the studied area during this time period.

**Keywords:** Landslide, radar interferometric, Sentinel 1, Sarbaz region, Reduce Hazards.

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## **Analysis of perceived stress caused by covid-19 and its hazards management through emotion regulation and religious orientation**

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### **Introduction**

The corona virus was identified in December 2019 and spread rapidly in more than 200 countries around the world, leading to increasing fear and anxiety among the people of the world. Many researches have shown a wide range of psychological and social effects on people at the individual, community and international level during the outbreak of a disease. Medical staff are vulnerable to infection due to close contact with covid-19 patients and can spread the virus among colleagues and family members. There is consensus that the COVID-19 pandemic affects not only physical health but also mental health and well-being. Previous reviews have reported that health care workers who provide frontline care during viral epidemics are at high risk for developing mental health problems. Because the current epidemic is a relatively new type of stressful or traumatic factor from the point of view of psychopathology. The psychological effects of stress experienced by physicians during the COVID-19 outbreak may have serious consequences for their overall health. Therefore, it is valuable to examine the level of perceived stress in health care workers during the current outbreak. Workers who provide front-line health care during outbreaks are at increased risk for stress-related problems, both in the short and long term.

### **Materials and Methods**

The current research is a quantitative descriptive-correlation study of the regression type, which is included in the category of descriptive designs. The statistical population of the research was all the employees involved with the patients of Covid 19 of Imam Hassan Hospital of Bojnord in the year 1400 in the number of 280 people who were selected as a sample using the census method of the entire research community and after applying the exit criteria, 221 people remained with Exit criteria. Then the research questionnaires were distributed among the subjects and they were asked to complete the relevant

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questionnaires. After collecting the questionnaires, the questionnaires that were incompletely answered or had no answers at all were discarded and finally 221 questionnaires were analyzed. All the employees of Hospital and working in different shifts of the said hospital were considered as criteria for entering the research. Data analysis was done using Pearson's correlation test and step-by-step multiple regression analysis in SPSS26 software.

**Perceived Stress Questionnaire:** This questionnaire has 14 questions prepared by Cohen et al. in 1993 and measures the amount of stress that a person has experienced during the last month in his life, and on a scale of 5 options, never until Very high (0-4) is scored.

**Emotion Regulation Questionnaire:** This questionnaire was prepared by Gross and John (2003) in order to measure emotion regulation strategies. The above scale consists of 10 items, which have two subscales of reappraisal (6 items) and suppression (4 items). Answers are based on a seven-point Likert scale, from completely disagree (1) to completely agree (7).

**Religious Orientation Questionnaire:** This questionnaire has 20 items and measures external (11 items) and internal (9 items) religious orientation. Fegin in 1963 used a 21-item version of construction and all the options of Allport's questionnaire in it, and in addition to that, he added another option, which had a high correlation (0.61) with external orientation, so This questionnaire was used.

### **Research findings and discussion**

The analysis of the data collected in the field of demographic information showed that the average age of the employees was 22/67 years and the standard deviation of their age was 6.53 years, and the employees involved with Covid-19 were between 18 and 61 years old. 160 subjects (%72.4) were single and 61 subjects (%27.6) were married. The non-significance of the Z statistic for the research variables shows that the curve of the distribution of scores of these variables is of a normal type and the assumption of normality of the distribution of scores has been met. Also, the probability of F value for checking the linearity of the factor did not exceed 0.05, so it can be concluded that there is a linear relationship between the predictor variables and the criterion variable. Among the predictor variables, the correlation between internal religious orientation and perceived stress was -0.351 and the correlation of reappraisal with perceived stress was -0.293 and both of these coefficients are significant ( $p < 0.01$ ). The negative direction of these correlations shows that the higher the level of internal religious orientation in people and their use of re-evaluation emotion regulation, the lower the level of perceived stress in them. On the other hand, the positive and significant correlation between suppressive emotion regulation and perceived stress shows that the more people use this component of emotion regulation, it leads to an increase in their perceived stress. Also, based on the obtained results, it can be seen that there is no significant

relationship between external religious orientation and perceived stress ( $p < 0.05$ ). In addition, the three variables of internal religious orientation, reappraisal and repression together could predict 23.7% of perceived stress, which was statistically significant ( $p < 0.001$ ). Reappraisal, internal religious orientation and repression have the greatest contribution in predicting perceived stress.

### Conclusion

The present study was conducted with the aim of predicting the perceived stress of employees dealing with covid-19 based on emotional regulation and religious orientation, and the results showed that the re-evaluation component of emotional regulation and internal religious orientation both have the ability to predict perceived stress. have a negative meaning, which means that the increase of these components in the employees of the Covid-19 department leads to a decrease in their perceived stress. Also, the results indicated that the suppression component of emotion regulation has the ability to positively predict perceived stress, which means that an increase in this component leads to an increase in perceived stress. In general, it can be said that what causes people's perception of difficult life and work situations and their vulnerability in these situations is the type of emotional regulation strategies and their religious orientation. On the other hand, people's religious orientation can influence how people perceive and deal with situations and increase people's resilience in difficult situations, and then help their mental and physical health. For this reason, according to the findings of this research, it is necessary to pay more attention to these factors in the design of psychological interventions in the treatment staff. Therefore, one of the proposals of this research is the use of interventions that cause adaptive regulation of emotion in people. At the same time, spirituality-oriented interventions should also be taken into consideration.

**Keywords:** Perceived stress, Covid-19, Hazards management, Religious orientation, Emotion regulation.

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