

OCCUPATIONAL HEALTH AND SAFETY RISK ASSESSMENT FOR ENTREPRENEURS

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ABSTRACT

Occupational health and safety includes the physical, emotional and mental well-being of the employee while doing their job. Risk assessment is the most important step in occupational health and safety. Risk assessment in occupational health and safety is carried out in a workplace to protect the interests of both the employer and the employees. Thus, it is aimed to eliminate events such as loss of labor, loss of production and cost, and work accidents. Today, various methods are used for risk assessment. One of these is the Fine Kinney Method. In this study, it is aimed to evaluate the Fine Kinney method, one of the risk assessment methods within the scope of occupational health and safety, with an example. In the study conducted, in order to examine occupational health and safety measures in the office environment for entrepreneurs, potential hazards were determined using the Fine-Kinney risk assessment method and corrective measures were planned to reduce risk levels.

Keywords: Entrepreneurship, Occupational safety, Risk analysis, Fine kinney

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INTRODUCTION

Delivering material prosperity and high living standards are extremely important goals for democratically elected governments. But finding the best way to achieve these goals has been the focus of much theoretical and policy debate. However, there is widespread agreement that long-term economic growth and development depends on innovation, production and entrepreneurship. Technical, economic and legal units in which factors of production are brought together are referred to as enterprises or businesses. All efforts of the entrepreneur to establish a business or to bring together the factors of production can also be defined as an enterprise (Feldman et al., 2016; Tutar & Küçük, 2003). The entrepreneur is a person who brings together and activates production elements such as natural resources, capital and labor by assuming the risk in order to realize the production of goods and services. According to another definition, an entrepreneur is the person who establishes, directs, plans and executes the business for the future. An entrepreneur is "a person who risks his/her financial resources in order to realize certain business activities and aims to make a profit". In other words, "Anyone who opens a business to produce goods and services for the benefit of all people by using any financing method (with their own resources, savings, credit, debt or no money) by using knowledge as a basis, choosing a field suitable for general trends and themselves and / or subjecting their knowledge to entrepreneurship, using any financing method (with their own resources, savings, credit, debt or no

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money) to produce goods and services for the benefit of all people, and maintains their economic needs, economic wealth, independence, social prestige, self-acceptance and self-transcendence in the business they have opened, and who desire and strive to maintain it" is an entrepreneur (Tekin 2004; Akdemir, 2009).

Entrepreneurship's potential to drive innovation, job creation, and welfare is closely tied to the economic, social, political, and cultural factors that shape its environment. In the face of heightened global competition, countries now place greater emphasis on developing an innovative and productive economic capacity and potential. In recent research on entrepreneurship, alongside global trends, a shift in methodology has taken place since the 1980s, and entrepreneurship is now being examined from a broader and more integrated standpoint, considering the ecosystem as a whole, rather than solely focusing on individual traits and circumstances. When it comes to defining entrepreneurship, focusing solely on who the entrepreneur is and what they do falls short in providing a comprehensive framework. Identifying an individual who creates a new organization as an entrepreneur is an illustration of this issue. This definition leads researchers to overlook measuring opportunities because it fails to consider the variety in the types of opportunities that different individuals observe. Entrepreneurship involves the intersection of two distinct phenomena. The first of these phenomena is the availability of opportunities, while the other is the presence of entrepreneurial individuals. As a scientific discipline, entrepreneurship is defined in relation to the inquiries of how, by whom, and with what consequences opportunities are identified, assessed, and utilized to generate future products and services. As a result, the field of entrepreneurship encompasses the study of the procedures involved in identifying, assessing, and implementing opportunities, as well as the individuals who are responsible for these actions. Entrepreneurship cannot be solely attributed to the inherent qualities of specific individuals, regardless of the circumstances they find themselves in (Okpara, 2007; Oly Ndubisi & Iftihkar, 2015; Carayannis et al., 2015).

Technological progress and demographic change have brought with them new opportunities and threats and triggered societal change. To cope with this change, institutions and people have recognized the importance of entrepreneurship. The benefits of entrepreneurship for economic development are widely recognized, as entrepreneurship has experienced a remarkable resurgence over the last three decades in countries that have significantly reduced poverty. Entrepreneurship is more important for economic growth and development in modern open market economies than ever before. Technological advances, especially since the 1980s, have brought about significant changes in the way countries develop their economies. Research shows that entrepreneurship plays a key role in the economic growth and development of nations. New ventures not only create new products and/or employment opportunities, but also have a significant positive impact on productivity and efficiency improvements,

structural transformation, price reductions, and a wider variety of products (Naudé, 2013; Upreti, 2015; Oğuztimur & Seçkin, 2018).

For entrepreneurship to flourish, it is crucial to have a qualified workforce. The presence of well-educated individuals in a region makes it easier to meet the demand for skilled labor. Moreover, entrepreneurs require knowledge in various areas including financial planning, marketing, product design, customer satisfaction, and logistics. Regions with a higher concentration of well-educated individuals tend to have a greater number of potential entrepreneurs. Research also highlights the importance of a good education as a characteristic of successful entrepreneurs. Studies further demonstrate that human capital, primarily influenced by education, has a significant impact on entrepreneurship. Human capital enhances individuals' ability to identify and capitalize on job opportunities, enables them to leverage financial and physical resources, and accelerates the acquisition of new knowledge and skills. These factors collectively contribute to the development of entrepreneurship in a country or region (Bozkurt et al., 2012; Sönmez & Toksoy, 2014).

Policymakers often assume that increasing the number of start-ups will transform economic regions in recession, generate innovation and create new jobs. The problem with this thinking is that typical start-ups are not always innovative and do not always deliver what is expected in terms of job creation and contribution to prosperity. Therefore, economic growth and job creation is not about the number of start-ups, but about fostering the creation of high quality and fast growing businesses. The three qualities that an entrepreneur should possess regardless of the subject of the venture can be expressed as having the motivation to be successful in the targeted field, being risk-taking and innovative, and having knowledge about the field of endeavor (Hisrich & Peters, 2001; Shane, 2009).

It is important to highlight a very delicate topic when analyzing how company size affects the availability of occupational safety. One may argue that worker safety is watched over under more stringent conditions and preserved more successfully in such an institutional framework if it is considered that the corporation becomes more institutionalized as its size grows. On the other hand, as the workforce grows, there is less control and oversight over each individual, and the likelihood of work-related accidents brought on by negligence or carelessness may rise. One could argue that automation of manual operations and the substitution of machines for human labor are typically undertaken in large, employee-heavy businesses. At this point, the mechanization of labor may cause employees to be seen as components of a technological device, and the need to protect them as unique individuals may be disregarded. As a result, there are instances where spending on equipment upkeep and repairs as well as new technologies surpasses spending on worker safety. It should not be overlooked at this point that a company's people resources, not its machinery or technology, are the most valuable asset that may set it apart from its rivals and boost its brand value. It is possible to replace worn-out or broken machinery

with new ones, but any circumstance that endangers worker health or safety will result in permanent injury and reputational loss (Edwards-Schachter et al., 2015; Ajiga et al., 2024).

The advancement of technology and industrialization in our country has introduced significant challenges concerning occupational safety and the health of employees, particularly in small and medium-sized enterprises. Initially overlooked, this issue has gradually gained attention as it places both institutions and their workers in precarious situations. Among the most critical concerns are the thousands of lives lost, severe injuries sustained, irreversible health conditions, and disabilities caused by workplace accidents, leaving many to endure lifelong suffering. Key factors contributing to this predicament include inadequate attention to occupational health and safety, insufficient inspections, and the lack of comprehensive legal frameworks addressing the matter. Moreover, the perception of occupational health and safety as a financial burden by businesses, coupled with profit-driven motives, exacerbates the risk of workplace accidents. Employees often encounter risks to their health and safety during their professional lives. To eliminate or reduce these risks, implementing robust safety and health measures is crucial. Employers play a pivotal role in ensuring and managing employee safety, particularly by creating the safest possible working environments. A fundamental step in this direction is educating employees about occupational safety and health. Additionally, fostering a culture of awareness and prioritizing this issue within workplaces is essential for proactive prevention. Every workplace accident incurs significant losses, not only for the affected individual but also for the broader society. The repercussions are felt by employees, employers, and the community alike, highlighting the importance of preventive measures to mitigate these impacts (Kim et al., 2016; Lindholm et al., 2020; Anshari et al., 2022).

Security compliance and participation in businesses play a critical role in shaping safety performance. The smaller workforce in micro-scale SMEs compared to small-scale SMEs leads to distinct differences in organizational and safety climates, as well as in how security compliance and participation manifest through employee perceptions and behaviors. Variations in workforce size between these two types of enterprises often result in differing hierarchical structures, communication methods, and levels of social interaction within the organization. In micro-scale SMEs, having fewer employees can sometimes lead to reduced administrative oversight and inspections, increased flexibility in or disregard for established rules and procedures, and challenges in preventing errors and violations. Furthermore, close social relationships within these smaller teams may cause such behaviors and perceptions to be more readily accepted and normalized, ultimately turning them into habits. These dynamics significantly influence the safety and organizational climate of the business, highlighting the interconnectedness of workforce size, behavior, and security practices (Chan et al., 2005; Shamsuddin et al., 2015).

1. OCCUPATIONAL HEALTH AND SAFETY

The concept of occupational health and safety is one of the issues that have been emphasized in recent years. It consists of two definitions: occupational health and occupational safety. When we look at the concept of occupational health based on the definition of health, it is understood that the worker is in a state of physical, mental and social well-being in his/her work. According to the World Health Organization (WHO) and the International Labour Organization (ILO) (2005) mixed commission; "Occupational health aims to protect and promote the physical, mental and social well-being of workers in all occupations at the highest level; to prevent workers from losing their health due to working conditions; to protect workers from risks arising from factors harmful to health in the workplace; to ensure that workers work in a job suitable for their physical and psychological equipment and, in summary, to adapt work to people and to adapt each person to their work". Occupational safety, on the other hand, is a concept that includes technical measures to eliminate or minimize the dangers faced by working individuals during the performance of a job. The concept of occupational safety includes measures related to the working environment. At the core of the concept of occupational health and safety is the protection of employees against the risks they face due to work and the work environment.

Workplace safety climate is considered as a reflection of a work environment where safety measures are taken in production processes, occupational accidents are prevented and institutional barriers are eliminated. In addition, the contribution of innovation and investments in production factors (capital, raw materials, machinery and equipment, labor force, etc.) that will ensure staying ahead of competitors is considered important in gaining sustainable competitive advantage. Such organizations are those in which the intrapreneurship characteristics of employees who can mentally participate in the tendency to innovate products, services or processes and take initiative are approved. Otherwise, it is not possible to talk about the existence of a workplace where employees will be more comfortable in developing their entrepreneurial competencies and being creative by revealing their ideas (Zohar & Luria, 2005; Oenderstrup-Andersen et al., 2011; Öztürk & Babacan, 2012).

The phenomenon of change in every field all over the world manifests itself rapidly and effectively in working life. In order for an enterprise to take part in the process of change and to maintain its existence in a competitive environment, it must give importance to its employees. Changes in production technologies, industrialization and organizational models have not only changed working relations but also caused new and different problems to be added to the traditional health and safety problems encountered in the field of production. With the transition to mechanization and automation in production, the effective use of new technologies has emerged as both a positive and negative factor in terms of worker safety. Namely, automation in the workplace has secured worker health by enabling workers to do manual work automatically at some points, but on the other hand, when these machines

with new technology are not used properly, they have started to pose greater threats to worker health. In addition, some chemical substances or radiation, etc. brought by new technology have also emerged as factors that increase threats to workers' health (Gökçek, 1995; Fırat, 2008).

Occupational health and safety issues, which were not given much importance at first, started to gain importance as they jeopardized work efficiency, business profits and thus the rising graph of the business. Following all these developments, as a result of the studies on the health and safety of the employee in the enterprises, a number of rules covering the working order conditions in the workplaces have emerged. In addition, laws and laws on the health and safety of employees and certain articles in the laws and regulations and by-laws in accordance with them have been put into force. The ever-increasing change and advancement of technology has brought about changes in laws, as well as the necessity to approach the problems of occupational health and safety from different angles. At this point, the most fundamental perception change in the approach to occupational safety is that the main goal of occupational safety should not be to minimize occupational accidents or to reduce the damage that may occur as a result of occupational accidents, but to completely eliminate all possible conditions that may lead to occupational accidents. In order to achieve this, "worst-case scenarios" should be tested on all possible situations that could lead to the occurrence of occupational accidents in an enterprise or in a production system or that could threaten occupational safety in any way, so that all risks for the occurrence of a situation that could threaten occupational safety should be completely eliminated (Aktuğ, 2009; Altınel, 2011).

The initiatives it has realized in a certain environment and the people who work with healthy life directly or indirectly contributing to the creation of working conditions individuals and institutions that positively or negatively affect working conditions All of the systems it brings are occupational health systems. Risks that negatively affect the working and living conditions of employees resources are also based on the organizational structures of the business units and the approach to the worker. perceptions. The function of the occupational health system is to prevent risks. This assessment takes place in two stages. The first stage; the enterprise and sub is the analysis of systems. The second stage is the quantitative and qualitative questioning of the inputs and outputs of the system. As in every system, the occupational health system also has inputs and outputs. With the globalization process, SMEs are becoming more important economically, as they can easily adapt to the market economy, flexible production, product diversity, changes in the market and cope more easily with frequent economic crises. A significant portion of SMEs have high-risk production processes and are inadequate in terms of OHS. Their inability to allocate sufficient resources to OHS organization as a result of their insufficient capital structure, lack of training and the state's inability to develop an effective management system for SMEs due to economic concerns are the main reasons for the high number of occupational accidents in SMEs. In particular, no development has been achieved in the field of Joint OHS units,

which will make it easier to provide OHS services to such enterprises, examples of which can be seen in EU countries. As long as OHS problems in SMEs are not effectively addressed, it does not seem possible to reduce the number of occupational accidents in our country (Gökpınar, 2004; Özkılıç, 2005).

The primary cause of workplace accidents is unsafe behavior by employees. Current developments highlight that one effective way to address unsafe behavior is by fostering a robust safety culture. Safety culture is a foundational societal concept that can only be established through collaborative efforts among the state, employers, and employees. However, the growing emphasis on the human element in businesses has shifted focus away from material investments, such as personal protective equipment, machinery, and environmental regulations, in the context of occupational health and safety. Businesses are increasingly recognizing the importance of employee training and awareness as key components in promoting occupational health and safety. Analyzing the health and safety policies of highly institutionalized organizations reveals a transition from material investments to prioritizing the development of an informed and conscious workforce. This shift underscores the importance of human resource-focused strategies aimed at cultivating a safety-aware employee profile, with training serving as the primary tool in achieving this objective (Dodoo & Al-Samarraie, 2019; Zhang et al., 2023).

2. MATERIAL AND METHODS

Within the scope of the study, office space was selected to guide entrepreneurs on the risk assessment work to be done in the field of occupational health and safety. First of all, by listing the risk factors in the office area, entrepreneurs were shown how many risks there can be in terms of occupational health and safety even in a simple office area. Then a risk assessment was conducted in a sample office space. Fine-Kinney method, which can be easily prepared by every entrepreneur and is the most preferred risk assessment method, was preferred.

2.1. Risk Factors in Offices

Environmental Factors: Environmental factors create an additional burden for the employee. It is necessary to know these factors and to recognize the physiological responses of the organism in normal or excessive levels of these factors in order to prevent a decrease in work performance and damage to health (Tappura & Saarela, 2014; Kim et al., 2018)

Noise: Noise is generally defined as unwanted and disturbing sound. A healthy human ear is sensitive to sound intensity between 0 dB - 140 dB. In addition, the frequency ranges of 3000-4000 Hz and the sound pressure range of 60-90 dB is the range to which the human ear is most sensitive. Noise in offices is not high enough to cause hearing loss. However, in industrial environments, hearing loss is possible due to noise. Noise has two kinds of effects on humans: physiological and psychological. The

average noise level in the office environment is in the range of 50-55 dB (Davies & Jones, 1982; Stewart et al., 2016).

Temperature, Humidity and Airflow (Thermal Comfort): The importance of indoor air quality in workplaces is increasing today due to its direct relationship with people's health and productivity. In this respect, it is extremely important to ensure thermal comfort in offices where employees spend at least eight hours a day. Indoor temperature is the most important parameter among thermal comfort conditions. Indoor temperature should be at a level where people feel comfortable according to winter and summer conditions. The temperature should be neither too low nor too high. Although the indoor air temperature is mostly selected according to the outside temperature in summer conditions, the indoor design temperature in winter is determined according to the purpose and type of use of the environment. The ambient temperature at which many people work comfortably is 20-26 °C (Tarcan et al., 2004; Al Horr et al., 2016). The amount of humidity in the indoor environment is another factor determining thermal comfort. Humid and hot air above normal is troublesome air. In low humidity, dryness in the nose, eyes and mouth occurs and the body loses water rapidly, so the need to drink water frequently is felt. Indoor relative humidity is recommended to be between 30-70%. In fact, the temperature and relative humidity values of the indoor environment should be considered together. Therefore, comfort zones based on temperature and relative humidity are determined for summer and winter. The ideal air flow in an efficient and healthy workplace environment should be around 150 mm/sec. When this flow reaches 510 mm/sec, the environment is characterized as "breezy" and when it drops to 100 mm/sec, the environment is characterized as "stuffy" (Jones, 1999; Arif et al., 2016).

Lighting: The need for lighting in offices varies according to the necessity of the work done. The lighting we need is provided in two ways: Natural light and artificial light. Natural lighting is of great importance in today's world where green buildings are increasing and energy saving is very important. Office architecture should be designed to make maximum use of natural light. Daylight has many positive effects on people because it has a higher illumination intensity than artificial lighting. On a sunny day, the illumination intensity can be 100,000 lux outdoors and 10,000 lux in the shade. With artificial lighting, a lighting intensity of around 500 lux can usually be achieved in workplaces (Ganslandt & Hofmann, 1992; Bhandary et al., 2021). In the lighting provided in the workplaces, the light should have a comfort that does not disturb the eyes and a balanced distribution is required. Light focusing should be applied to the right points, such as placing a desk lamp next to the plan or project being worked on. It is necessary not to reduce the performance of employees by using low-contrast light. Reflections of light should be used correctly and how much light will be reflected from the ceiling, wall, floor or tables should be well calculated. The light used for lighting in workplaces should not dazzle, the right color and tone should be selected, and there should be no flickering as in fluorescence. Daylight should also be taken into account when calculating total lighting. Lighting types are divided into two

as direct and indirect. Direct illumination is the illumination of a surface with light rays coming from a source in a straight line. Direct illumination creates locally high luminescence and creates dark shadows behind the objects in the direction of the light. Very high luminescence creates glare in the eye and is uncomfortable. Direct lighting is used in workplaces, especially for jobs that require high visibility, such as quality control jobs (Gilmore & Pine, 1997; Bellia et al., 2022).

Chemicals: Various chemicals such as printer and cartridge toners, cleaning agents, batteries, tubes, adhesives, ink and office supplies are used in offices. Tubes, adhesives, ink and office supplies are among the main hazardous substances used. In addition, photocopiers and laser printers, which are among the most frequently used electronic devices in offices, emit ozone. However, although such substances are hazardous, they can be considered practically harmless due to the low risk of exposure (Nandan et al., 2019).

Plants: According to NASA research, plants reduce the levels of toxic substances such as benzol, carbon monoxide and formaldehyde in the air (Hashim & Anuar, 2017).

Physical Factors: Ergonomic physical factors are concerned with the anatomical, anthropometric, physiological and biomechanical characteristics of people in relation to their physical activities. Therefore, postural characteristics during work, repetitive movements, work-related musculoskeletal systems, workplace layout, safety and health are the main topics of physical factors related to ergonomics (Kroemer & Kroemer, 1997).

- **Windows:** Windows in the workplace should open, close and adjust securely. External windows and grilles should be constructed so that light is diffused widely and evenly throughout the workplace and can be easily opened, closed and cleaned as required. The ratio of all openings that allow light to enter - on the side wall and overhead - to the floor surface should be at least 10% (Cheng et al, 2020).
- **Emergency Exit Roads and Doors:** Every building should be equipped with hazard exits of a type, location and capacity appropriate to the occupant load, level of fire protection, construction and height to provide adequate means of escape for all occupants. Each exit must be clearly visible. Exits must be arranged in accordance with the "Regulation on Safety and Health Signs". Signs must be placed in appropriate places and permanently. Emergency exit doors should open outwards and provide access to a safe area. Escape routes must be continuous and unobstructed to the street. In addition, flooring and coverings in the workplace should be solid, dry and as flat and non-slip as possible, with no dangerous slopes, pits or obstructions. Electrical cables should not be scattered on the ground, but should be collected and covered so as not to interfere with walking (Ahmed & Hossain, 2009; Parlak et al., 2023).

- **Toilets and Sinks:** Necessary ventilation and lighting should be provided and odors should be prevented. Sufficient cleaning materials must be provided for toilets and sinks. Toilets should not be more than one floor higher or lower than the workplace and should not open directly into the workplace (Johnson & Fujishiro, 2023).
- **Monitor:** Characters appearing on the screen should be in a shape and form that can be easily selected, should be of appropriate size, and there should be sufficient space between lines and characters. The screen image must be stable and free from flickering and similar problems. Brightness and contrast between the characters and the background should be easily adjustable by the operator. The screen should be easily adjustable by rotating in any direction according to the operator's needs. It should be possible to use the screen on a separate pedestal or an adjustable table. Reflections and glare that may disturb the user should be prevented. The monitor should be at least 65 cm away from the eyes. It is generally recommended to place the monitor as far away as possible and to increase the font size (Rosenfield, 2011).
- **Neck Posture:** Low monitor placement allows users to experiment with positions that provide different neck movements. A monitor placed at eye level, on the other hand, forces the user to stay in only one type of position that is suitable for both posture and vision (Land, 2006).
- **Keyboard:** The keyboard should be separate from the screen and movable so that the worker's hands and arms do not get tired and can work comfortably. Special support should be placed in front of the keyboard where the worker can rest his/her wrists. There should be enough space in front of the keyboard for the worker's hands and arms. The color of the keyboard should be matte and should not reflect light. According to the working position, the symbols on the keys should be easily selectable, smooth and legible (Shin & Zhu, 2011).
- **Desk or Work Surface:** The desk or work surface must be of sufficient size and with a surface that does not reflect light, so as to allow the screen, keyboard, documents and other related materials to be arranged comfortably. An adjustable document holder should be used, placed in such a way as to minimize the need for disturbing eye and head movements. There must be sufficient space for the worker to be in a comfortable position (Chandra et al., 2009).
- **Work Chair:** The chair should be balanced and in such a way that the worker can sit in a comfortable position and move easily. The height of the seat should be adjustable. The backrest should be adjustable forward-backward and up-down, the back support should be suitable and flexible for the waist. A suitable footrest should be provided to the operator when requested (Workineh & Yamaura, 2016).

- **Repetitive Work:** Repetitive tasks are tasks that require frequent repetition of the same or similar movements during work. Touching a button by hand more than two times a minute for more than two hours without a break or entering data on a keyboard for more than four hours a day without a break are examples of repetitive work. In repetitive work, pain and discomfort in the musculoskeletal system are inevitable if adequate breaks are not given for the muscles to rest (Latto et al., 1997).
- **Improper Postures:** Inappropriate postures are postures other than the natural posture. Natural posture is the safest and most comfortable posture for work. Unnatural postures put pressure on muscles and joints, straining the body's physical limits. Working with hands above shoulder and head level for more than two hours a day, kneeling for more than two hours a day, bending or twisting the waist for more than two hours a day, and sitting without support for the feet are among the inappropriate postures that employees do not pay attention to (Claus et al., 2009).
- **Static Posture:** These are postures in which the worker has to work in the same position for a long time. In static postures, blood flow is restricted and muscle fatigue and injuries occur. The effects of static posture can be limited by ergonomic improvements (Haslegrave, 1994).

Psychological Factors

- **Factors Arising from the Employee:** Conflicts (surprise, mistake, forgetfulness), sadness, family problems, professional problems, economic difficulties, insecurity, negative social communication at the workplace, gossip, conflicts with employees are among the factors arising from the employee (Zhang & Luximon, 2005).
- **Factors Arising from the Structure of Work:** Factors arising from the nature of the work include workload and nature of the work, pressure from supervisors, monotony, diversity or versatility of the task, pressure to work in a group (Greenglass et al., 2003).
- **Factors Arising from the Structure of the Business:** Role conflict and role ambiguity, limited career, low wages are factors arising from the structure of the organization (Schuler et al., 1977).

2.2. Risk Analysis Method

Risk analysis approaches are separated into two categories: quantitative and qualitative methods. Quantitative risk analysis assesses risk using numerical approaches. In qualitative risk analysis, numerical values are assigned to variables such as the probability of threat occurrence and the impact of the threat, and the risk value is calculated by processing these values using mathematical and logical procedures. The main risk analysis methods include primary risk analysis using a checklist,

Cause-Effect Analysis, Hazard and Operability Analysis (HAZOP), risk assessment using Decision Matrix Methodology (L-type and X-type Matrix), Fault Tree Analysis (FTA), Failure Mode and Effects Analysis (FMEA), and the Fine-Kinney Method (Seber, 2012; Oturakçı & Dağsuyu, 2017).

Kinney and Wiruth (1976) established the Fine Kinney technique, a quantitative risk assessment approach based on MIL-STD-882 criteria. For each detected danger, this technique considers three characteristics (probability, exposure, and probable effects). The Fine-Kinney method is a technique used to rate risks, which tasks should be prioritized based on the results of the rating, and where resources should be allocated first. The parameters are then multiplied to generate a "Risk Score," as stated in Eq (1). The assessment tables for the ideas used to construct the risk score are presented in Tables 1–3, and the risk score itself is shown in Table 4.

$$\text{Risk Score} = \text{Likelihood of Hazardous Event} \times \text{The Exposure Factor} \times \text{Possible Consequence} \quad (1)$$

This strategy evaluates the effects of potential hazards. If the danger materializes, the extent of the injury or damage to individuals, the workplace, and the environment is determined. It is a simple and popular strategy. It supports the usage of workplace statistics. The urgency of the steps to be performed is decided by the high risk value, and the priority is graded based on the risk level.

Likelihood of Hazardous Event	Value	Possible Consequences	Value
Might well be expected	10	Catastrpoh (many fatalities, or > \$107 damage)	100
Quite possible	6	Disaster (few fatalities, or > \$106 damage)	40
Unusual but possible	3	Very serious (fatality, or > \$105 damage)	15
Only remotely possible	1	Serious (serious injury, or > \$104 damage)	7
Conceivable but very unlikely	0,5	Important (disability, or > \$103 damage)	3
Pratically impossible	0,2	Noticeable (minor first aid accident, or > \$100 damage)	1
Virtually impossible	0,1		
Risk Score = Likelihood x Exposure x Consequences			
Exposure Factor	Value	Risk Situation	Risk Score
Continous	10	Very high risk; consider discontinuing operation	>400
Frequent (daily)	6	High risk; immediate correction required	200-400
Occasional (weekly)	3	Substantial risk; correction needed	70-200
Unusual (monthly)	2	Possible risk; attention indicated	20-70
Rare (a few per year)	1	Acceptable risk; perhaps acceptable	>20
Very rare (yearly)	0,5		

Figure 1. The Values for Likelihood of Hazardous Event, Exposure Factor Possible Consuquences and the Risk Score Definitons

Kinney and Wiruth, in their 1976 study, defined 'Highly Likely' as an event that has already occurred, is likely to recur and will occur in the future, and assigned 10 to this value. Another reference point, 'Extremely Low Probability', was assigned a value of 1. The value of the 'Almost Impossible' probability, which constitutes the lowest value of the probability scale, was assigned a value of 0.1 and the intermediate values were created as decreasing values depending on the experience. In the same study, Kinney and Wiruth also created a scale table for frequency values. The reference values in the frequency indicator consist of a range of 10 and 0.5. In the frequency table, risks are categorized

according to their frequency of occurrence on time basis such as hourly, daily, yearly. As can be seen in Table 2, if the frequency of the identified risk is 'hourly', the risk is considered to occur 'continuously' and the frequency value used in the formation of the risk value is determined as the highest value 10 and the lowest value 0.5 in the table. In the table of values prepared for severity, which is the third variable in the calculation of the risk score, the amount of cost and/or damage resulting from the risk is taken into account. The violence scale table obtained as a result of this calculation is given in Table 3. In the scale created here, values are determined by taking into account the cost and/or mortality rate that the violence will cause. Depending on the determined risk, probability, frequency and severity values are obtained from the relevant tables and the risk score is determined by multiplying the three parameters with each other. The risk values obtained are classified according to Table 4 (Hendrickx, et al., 1992; Oturakçı, 2017; Kokangül et al., 2017; Altın et al., 2018).

3. SAMPLE RISK ANALYSIS AND ASSESSMENT

In the study conducted, in order to examine occupational health and safety measures in the office environment for entrepreneurs, potential hazards were determined using the Fine-Kinney risk assessment method and corrective measures were planned to reduce risk levels and are listed in Table 1 with thirteen different steps. In the Fine-Kinney method, 70 points is the limit value for the Risk Score (R). It is important to improve risks above 70 points (Kinney and Wiruth, 1976). Other risk score ranges and guidance phrases regarding precautions to be taken are given below.

- For risks in the range of 0-20, no control may be required. Existing protection measures should be continued to prevent a significant danger in the future.
- The range of 20-70 is the range where the majority of risks occur in practice. The risks found can be included in the action plan, and the necessary training should be provided to the personnel while control methods and minor improvements that ensure that the risk is kept at this level are implemented.
- A corrective and preventive action must be planned for risks that are between 70 and 200. For risks with a score of 70 and above, the current situation, precautions to be taken, and those responsible must be determined for the planned actions.
- Risks between 200-400 should be included in the short-term action plan and improvements should be made within a few months.
- In case of risks with scores of 400 and higher, immediate action should be taken.

While the frequency and severity of the hazardous event do not change with the measures taken, the probability values may change. For risks that still have a score of 70 and above after improvements, the measures should be reviewed and renewed. For studies that remain outside the acceptable risk values despite all measures, the relevant persons should be notified about the issue and the necessary measures

should be taken. If there are risks with a risk score above 400 despite the improvements, this information should be shared with the upper management and a more radical solution should be sought. As improvements are made, the scoring should be reviewed and the risk assessment should be renewed.

Table 1. Risk Assessment Table

COMPANY NAME		RISK ASSESSMENT TABLE										Date of Realization	2.09.2024							
ADDRESS												Validity Date	2.09.2029							
PHONE / FAX												Revision Date								
HAZARD IDENTIFICATION AND RISK ASSESSMENT FORM												ASSESSMENT OF RISK AS A RESULT OF THE 1ST REVISION								
Risk No	Activities	Danger Sources / Hazards	Detected Risk	Result	Affected	The Current Situation	Current Situation After Measures Taken	Risk Assessment				Possible / Corrective and Preventive Control Measures	Responsible	Deadline	Probability	Frequency	Severity	Score	Risk	
								Probability	Frequency	Severity	Score									
1	Floors	Floors are not clean, damaged and/or wet	Causes tripping, slipping and falling	Injury	All Employees and Customers	There are lifts and deformations in some parts of the floor covering.	Measures will be taken to prevent the ground from being wet.	3	10	3	90	Significant Risk	Floors will be checked regularly and unsuitable areas will be cleaned or repaired. Wet Floor Warning Sign will be used or the ground will be allowed to dry.	Manager	2.10.2024	0,5	1	3	1,5	Acceptable Risk
2	Warning Signs	Lack of warning signs regarding Occupational Health and Safety	Panic, Rush, Injury, Death as a result of stampede	Injury & Death	All Employees and Customers	There are no warning signs.	All relevant warning signs will be placed.	6	2	100	1200	Very High Risk	OHS warning signs will be provided and used where necessary.	Manager	3.10.2024	0,5	2	15	15	Acceptable Risk
3	Air Conditioning Systems	Failure to maintain air conditioning and air conditioning systems	The working environment is not conducive to work	Injury	All Employees and Customers	Air conditioning maintenance has not been done.	Periodic maintenance of air conditioners will be carried out by the authorized service.	3	6	3	54	Certain Risk	Periodic checks of air conditioning and air conditioning systems will be made.	Manager	4.10.2024	0,5	1	3	1,5	Acceptable Risk
4	Offices	Employees working with screen devices should not use ergonomic equipment.	Damage to the musculoskeletal system	Injury	All Employees and Customers	Ergonomic rules are not followed when working with screen devices.	Ergonomics training will be given to employees.	10	10	15	1500	Very High Risk	Purchase of ergonomic equipment (reference, Regulation on Working with Displayed Tools)	Manager	5.10.2024	1	1	3	3	Acceptable Risk
5	Offices	Failure to provide Thermal Comfort conditions (temperature, humidity and ventilation)	Carelessness and absent-mindedness	Injury	All Employees and Customers	Ventilation and thermal comfort conditions are not suitable.	Ventilation inside the office will be done at regular intervals.	3	10	1	30	Certain Risk	Periodically monitoring the working environment regarding thermal comfort conditions and taking necessary precautions	Manager	6.10.2024	0,5	10	1	5	Acceptable Risk

6	Offices	Falling of the hanging projection screen	Carelessness and absent-mindedness	Injury	All Employees and Customers	The projection screen is attached with 2 dowels.	The projection screen is attached with 8 dowels.	1	2	40	80	Significant Risk	Connections are checked periodically.	Manager	7.10.2024	0,2	2	40	16	Acceptable Risk
7	Offices	The office is crowded	Inability to escape in emergency situations	Injury & Death	All Employees and Customers	The number of employees is appropriate.	Attention will be paid to the number of employees and the number of customers.	3	3	40	360	High Risk	The layout will be updated according to thermal comfort conditions. Personnel will not be employed beyond the office capacity.	Manager	8.10.2024	1	0,5	40	20	Acceptable Risk
8	Doors	There are no information signs on some doors throughout the building	Leading people in the wrong direction	Injury	All Employees and Customers	Door warning signs are missing.	Door and company warning signs have been placed.	6	10	15	900	Very High Risk	Missing information signs will be provided and replaced.	Manager	9.10.2024	0,2	10	3	6	Acceptable Risk
9	Storage	Falling or tipping over of improperly stacked loads	Causing injuries	Injury	All Employees and Customers	Irregular stacking is carried out.	Precautions have been taken for stacking.	3	10	7	210	Significant Risk	Loads should be classified according to their weight and type, and stacked with heavy materials at the bottom.	Manager	10.10.2024	0,5	6	7	21	Certain Risk
10	Storage	The shelves may topple over and/or the materials on them may fall due to not being stable.	Causing injuries	Injury	All Employees and Customers	The shelves are not stable.	All shelves are stabled to the wall.	6	10	40	2400	Very High Risk	The shelves will be stabled.	Manager	11.10.2024	0,2	6	3	3,6	Acceptable Risk
11	Escape in Emergency Situations	Lack of sufficient number of warning signs for emergency escapes	Inability to escape in emergency situations	Injury & Death	All Employees and Customers	Warning signs are not available.	Warning signs have been placed.	10	6	100	6000	Very High Risk	OHS warning signs will be provided and used where necessary.	Manager	12.10.2024	0,2	6	3	3,6	Acceptable Risk
12	Emergency Escape Doors	Forced opening of emergency escape doors	Inability to escape easily	Injury & Death	All Employees and Customers	Emergency exit doors are locked.	Emergency exit doors are opened with a card.	10	6	100	6000	Very High Risk	Checking emergency escape doors periodically every day	Manager	13.10.2024	3	6	3	54	Certain Risk
13	Emergency Escape Doors	Emergency escape door is not suitable	Inability to escape easily	Injury & Death	All Employees and Customers	The emergency exit door is not suitable. The emergency exit door opens inward towards the office.	The emergency exit door opens to the outside.	10	6	100	6000	Very High Risk	The door is not used as an emergency exit. Emergency Exit Door opens to the inside.	Manager	14.10.2024	0,2	6	3	3,6	Acceptable Risk

RESULT AND DISCUSSION

One of the most critical ways to gain an advantage in global competition is undoubtedly through the development of production methods and processes that generate added value, employment, and innovation. In this context, entrepreneurship can serve as a tool to stand out in global competition and contribute to overall welfare by creating employment. However, this requires identifying the various actors and factors influencing entrepreneurship and determining the causal relationships among them. When examining different models that highlight the components of the entrepreneurial ecosystem, it is evident that the actors and factors affecting entrepreneurship have been identified. However, there is a notable lack of theoretically grounded and evidence-based studies exploring the causal relationships between these actors and factors. This gap represents a weak aspect of the entrepreneurial ecosystem approach, underscoring the need for more focus on this issue in academic research within the field of entrepreneurship.

In Turkey, awareness of occupational health and safety is increasing, and progress is being made in legal regulations and practices. However, in some organizations, neglecting occupational health and safety rules and procedures in relation to the organizational climate leads to negative outcomes. To prevent such outcomes, all stakeholders must fulfill their duties and responsibilities. Insufficient occupational safety practices or a lack of safety awareness in the workplace result in adverse situations such as workplace accidents, employee injuries, occupational diseases, and material and moral losses for employers. To mitigate these negative consequences, employees must receive proper safety training, integrate preventive practices into their work based on this training, report hazardous situations to their employers, and support their colleagues in adhering to safety measures. Occupational health and safety experts tasked with workplace inspections must be adequately trained, possess professional experience, and specialize in the areas they inspect. Another challenge in Turkey is the limited authority occupational health and safety experts have over workers and employees in their respective fields. The role of these experts should not be confined to providing training and conducting periodic inspections. Instead, warnings and preventive measures should always be prioritized and implemented. Employers must ensure collaboration between employees and health and safety service providers, train and inform workers, perform risk assessments and control measures, and oversee the effective functioning of occupational health and safety systems. In conclusion, the fulfillment of duties and responsibilities by various stakeholders is the most critical factor in achieving effective occupational health and safety.

Occupational health and safety include the protection of employees, reducing the number of workplace accidents, minimizing inadequate information, and increasing employee awareness. Risk assessment is one of the most important stages of occupational health and safety management. To identify risk sources and ensure control measures are taken before an injury or accident occurs, risk assessment and management are very important. A risk assessment in a workplace provides information

about the general development needs of employees regarding occupational health and safety. Occupational Health and Safety laws provide risk assessment for all employers regardless of the number of employees or the sector. Identifying the hazards and risks in the workplace ensures a healthy and safe working environment. The risks and hazards arising from the work environment and working conditions need to be comprehensively assessed. In the event that dangers cannot be completely eliminated, measures regarding the health and safety of employees should be evaluated, and the risk should be reduced to a manageable and controllable level.

The aim of this study was to examine the Fine Kinney method, one of the risk assessment techniques in the field of occupational health and safety. In the study, the Fine-Kinney risk assessment method was used to evaluate occupational health and safety measures in the office environment for entrepreneurs. The risk assessment identified potential hazards and calculated a score for each potential hazard. Studies have been planned to group these risks and reduce risk scores. Thirteen business steps, the risk score was reduced across all risk groups using the newly planned measures.

Risk assessment alone is not sufficient to prevent occupational diseases and accidents. Developments and changes in technology are introducing new dangers in the production process. Therefore, to effectively manage this process, employees with the competence to understand and analyze various risks are required. Therefore, it is particularly important for entrepreneurs working in an office environment to understand occupational health and safety, conduct risk assessments, and be aware of workplace hazards in order to carry out their work safely. After this study, similar studies can be conducted for different sectors, and the scope can be expanded with different risk assessment methods.

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