

# Occupational Safety Need Analysis for Turkey and Europe

Ismail Muratoglu, Ahmet Meyveci, Abdurrahman Tuncer, Erkan Demirci

**Abstract**—This study is dedicated to the analysis of the problems of occupational safety in Turkey, Italy and Poland. The need analysis was applied to three different countries which are Turkey; 4, Poland; 1, Italy; 1 state. The number of the subjects is 891 in Turkey. The number of the subjects is 26 in Italy and the number of the subjects is 19 in Poland. The total number of samples of study is 936. Four different forms (Job Security Experts Form, Student Form, Teacher Form and Company Form) were applied. Results of experts of job security forms are rate of 7.1%. Then, the students' forms are rate of 34.3%, teacher or instructor forms are rate of 9.9%. The last corporation forms are rate of 48.7%.

**Keywords**—Europe, need analysis, occupational safety, Turkey, vocational education.

## I. INTRODUCTION

THE benefits of having a healthy and safe working environment are widely recognized. Many studies in this field conclude that adequate working conditions have the potential to increase labor productivity and consequently improve the organizations' operational performance [1]-[3]. Other important benefits are that good working conditions can promote recruiting and retention of skilled workers and the social and economic costs of accidents can be eliminated or reduced [3].

The aim of Council Directive of 12 June 1989 on the Introduction of Measures to Encourage Improvements in the Safety and Health of Workers at Work (89/391/EEC) is to introduce measures to encourage improvements in the safety and health of workers at work. Although this directive has given birth to more than 20 individual directives for specific sectors such as the construction, mining and fishing, none of these individual directives are especially dedicated to ports [3], [4].

Occupational Health and Safety (OHS) has been and continues to be, a priority area for policy-makers, managers and workers. Occupational injuries and diseases result in significant costs to employers and impact on the private and social lives of individuals [5]-[7]. This is evidenced by the alarming statistics showing that more than two million work-related deaths and about 300 million nonfatal occupational accidents occur annually, resulting in global economic costs

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contributing to 4% of the global gross domestic product (GDP) [8], [9]. Because workers represent half of the world's population and are the major contributors to economic and social development, this magnitude of occupational accidents and fatalities calls for an urgent redress of the situation [10]. Less than 15% of the global workforce, primarily in big enterprises in developed countries, has access to OHS [11].

It is important to adopt healthy lifestyle behaviors in every stages of life, exclusively in workplaces where most of one's daily life is spent. Occupational health with a fundamental approach to preventive medicine is a field where activities aiming at the definition of health problems and protection of workers' health during work life take place [12]-[14]. According to [15], WHO promoting healthy behaviors in the workplace creates a safe and healthy work environment; increases self-confidence, moral force, job satisfaction, and health protection skills; and decreases stress. For the company, properly managed health and safety programs are created with a favorable and attentive outlook. These programs can lead to increased productivity while they decrease absenteeism, health expenditures, penalties, and some litigations [15].

According to Article 1 of the 2002 Protocol of Occupational Health and Safety Policy (1981) of the International Labour Organization (ILO), the term 'occupational accident' covers "an occurrence arising out of, or in the course of, work which results in fatal or non-fatal injury" [16].

## II. METHODOLOGY OF THE STUDY

### A. Samples

Study of the sample is composed of three countries. Studies were made in six different cities which are Turkey; 4, Poland; 1, Italy; 1 state. The total number of samples of study is 936. The advent of surveyed persons has been selected as an option with a nice sampling.

### B. Demographic Structure of the Study

The study was made three different countries. The number of enquetees is 891 in Turkey. The number of enquetees is 26 in Italy, and the numbers of enquetees are 19 in Poland. We can say that the total number of samples of study is 936. Turkey's survey distribution rate is 95.2%, 2% in Poland, 2.8% in Italy. The percentage of distribution is located in Fig. 1. At the same time, if we examine Fig. 2, Gaziantep in Turkey has the highest representation with 42.5% Bolu (Turkey) respectively is a rate of 29.9%, Tunceli (Turkey) is a rate of 11.9%, Ankara (Turkey) is a rate of 10.9%, Italy is a rate of 2.8%, and Poland is a rate of 1.6% representation.

The study is composed of three different forms:

- Job Security Experts Form,
- Student Form.
- Teacher Form and Company Form

Three different forms are regulated. These three different groups are applied to the study. Result of experts of job security's survey rate is 7.1%; 34.3% for students, and 9.9% for teachers or instructors. The percentage of participation is shown in Fig. 3.

C. Analysis

The survey consisted of 22 questions.

1. Company - Office Question Form and Analysis

Question 1. Choose the area of job branch.

Question 2. What is your job position in the company?

Question 3. How many staffs work in the company?

Question 4. How many staff are trained about occupational health?

The answer to these four questions is shown in Fig. 4. High ratios are expressed for an explanation of the questions.

The number of textile firms are 194, construction firms are 80, Automation firms are 15 from Turkey, Poland and Italy.

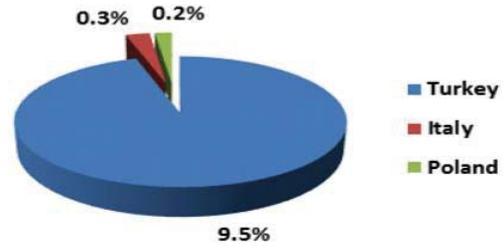


Fig. 1 Participation Rates of Countries in Survey %

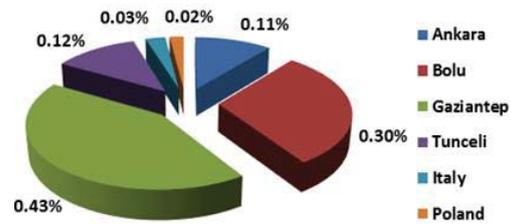


Fig. 2 Participation Rates of Cities and Countries in Survey %

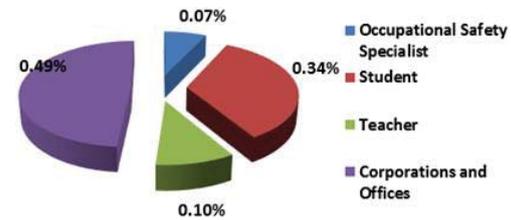


Fig. 3 Participation Rates of Form in Survey %

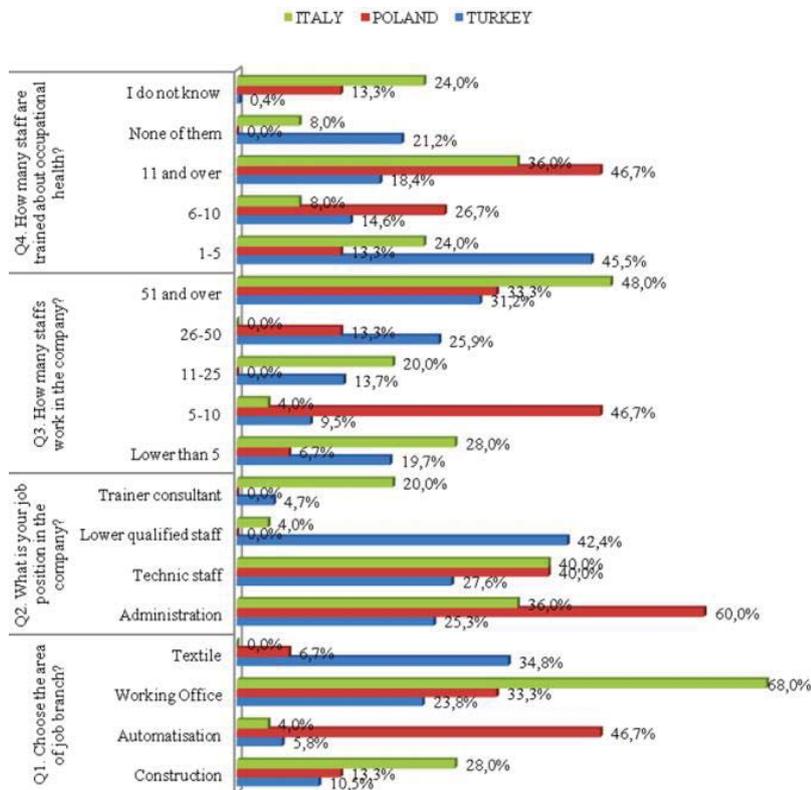


Fig. 4 Answer Rates of the Countries in Survey % (Q1:4)

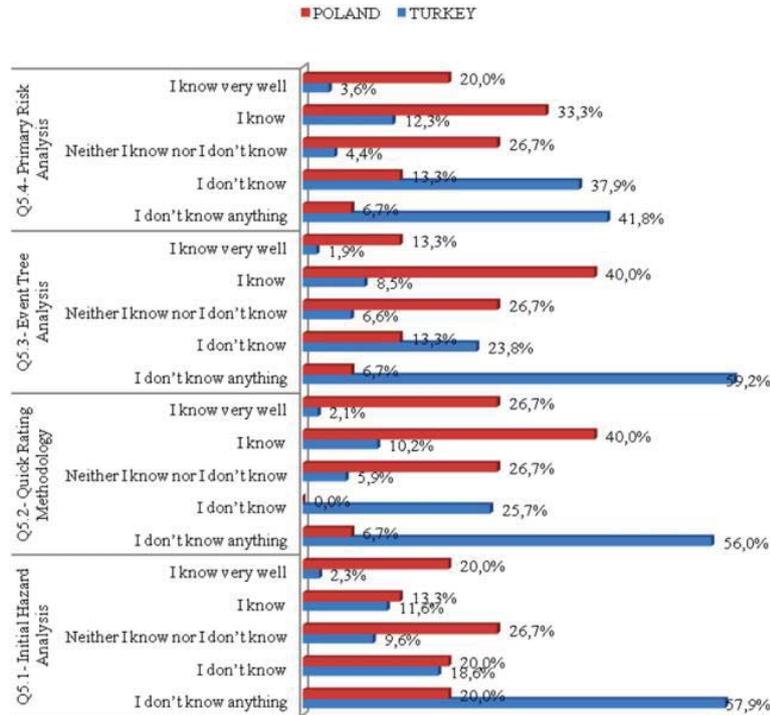


Fig. 5 Answer Rates of the Countries in Survey % (Q5-1:4)

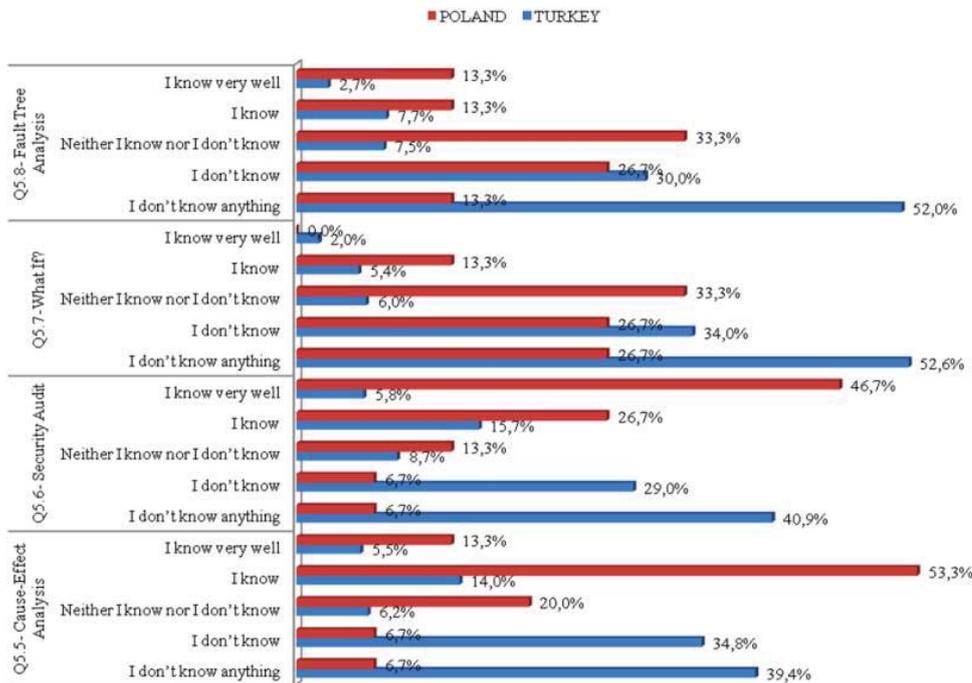


Fig. 6 Answer Rates of the Countries in Survey % (Q5-5:8)

According to Fig. 4 (Question 1), Working Office has been selected by about 68% of respondents in Poland. Automatisation has been selected by about 46.7% of respondents in Italy. In Turkey, textile has been selected by about 34.8% of respondents. In Question 2, about 60% of

respondents claimed they have administration in Poland (another 42.4% lower qualified staff in Turkey, 40% technic staff in Italy). As seen in Question 3, 51 and over staff in their company has been selected by about 48% of respondents in Italy. 5-10 staff in their company has been selected by about

46.7% of respondents in Poland. 26-50 staff in their company has been selected by about 25.9% of respondents in Turkey.

According to Question 4, 11 and over staff has been selected by about 46.7% of respondents in Poland and by

about 36% of respondents in Italy. 1-5 staff has been selected by about 45.5% of respondents in Turkey. The answers to these questions are shown in Figs. 5-8. It was only made between Turkey and Poland.

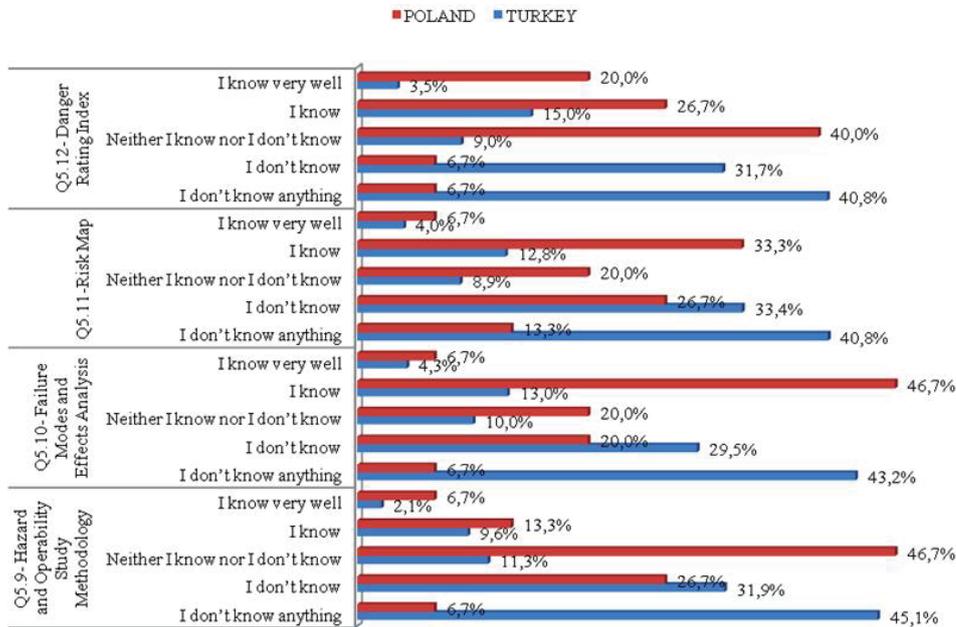


Fig. 7 Answer Rates of the Countries in Survey % (Q5-9:12)

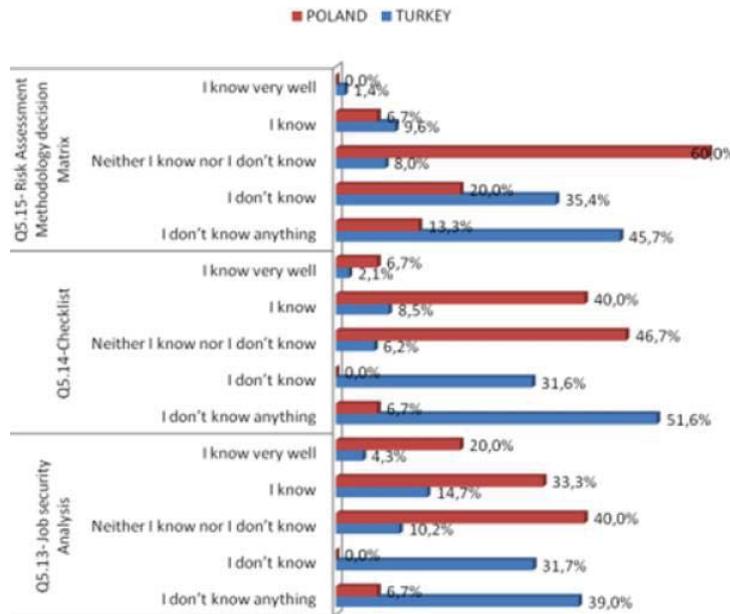


Fig. 8 Answer Rates of the Countries in Survey % (Q5-13:15)

As seen in Fig. 9, the majority of respondents clearly thought that average awareness in Turkey, Poland and Italy needs high point over 5. But Fig. 9 clearly shows that general average is 2.69 point over 5.

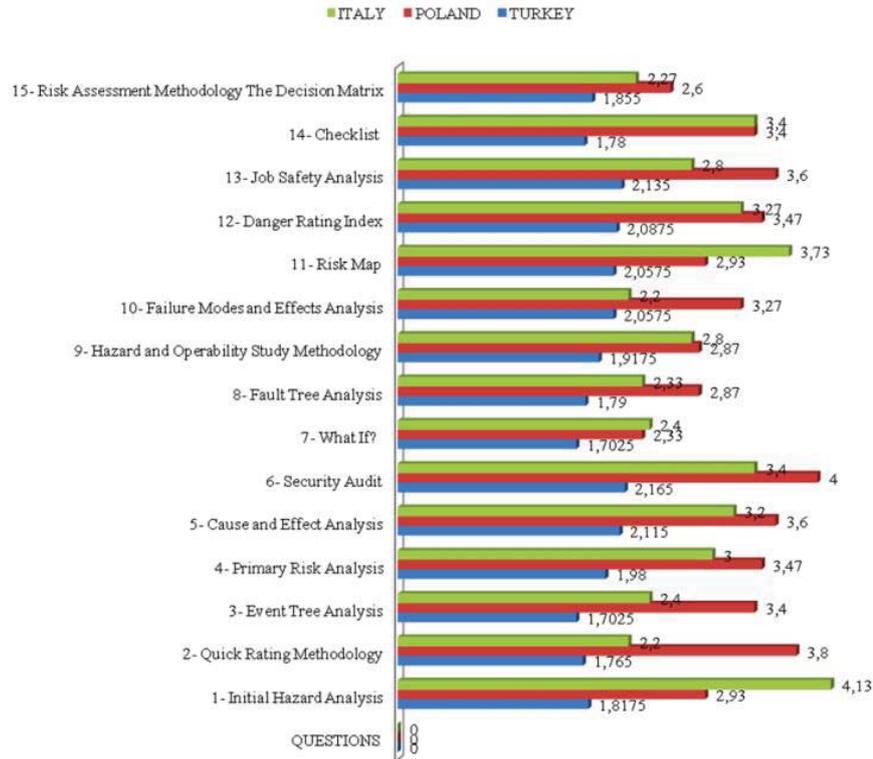


Fig. 9 Risk Analysis Methodology Awareness Average

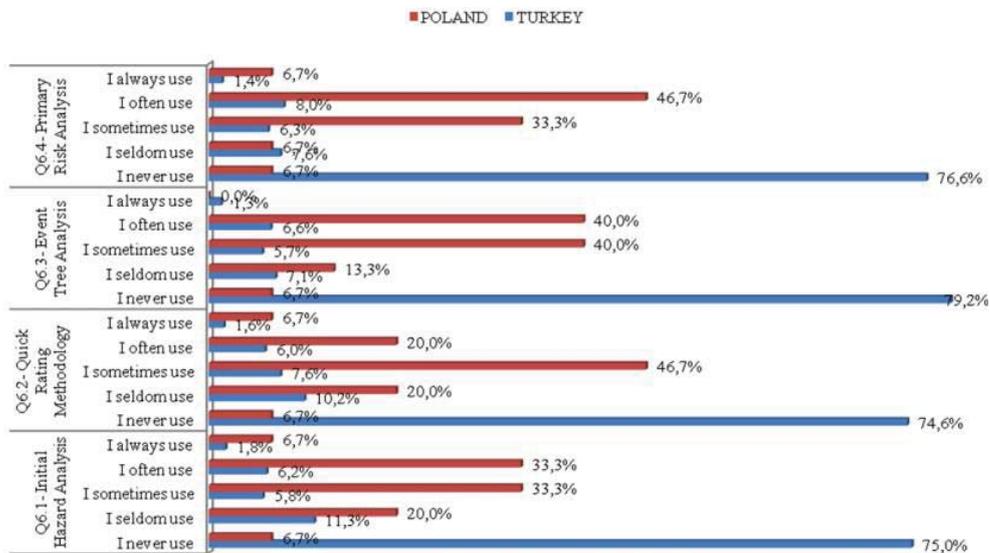


Fig. 10 Answer Rates of the Countries in Survey % (Q6-1:4)

Question 6 is “How often do you use the following risk analysis methods when you are doing risk analysis study?”. According to Question 6, which is shown in Figs. 10-14, the majority of respondents clearly thought that the risk analysis methodology awareness average in Turkey is (1.93%), in Italy is (2.90%) and in Poland is (3.24%). The risk analysis methodology awareness average is at very low level in Turkey when compared to Italy and Poland.

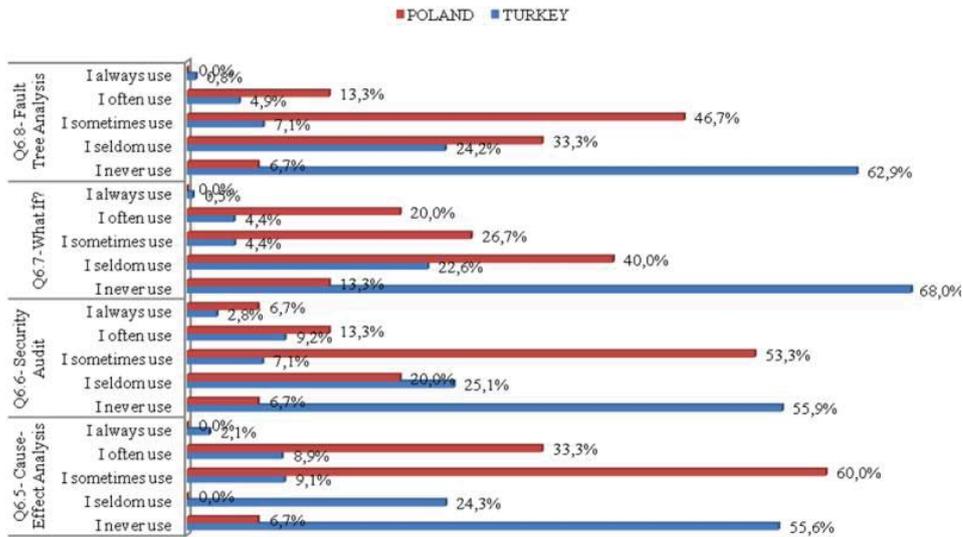


Fig. 11 Answer Rates of the Countries in Survey % (Q6-5:8)

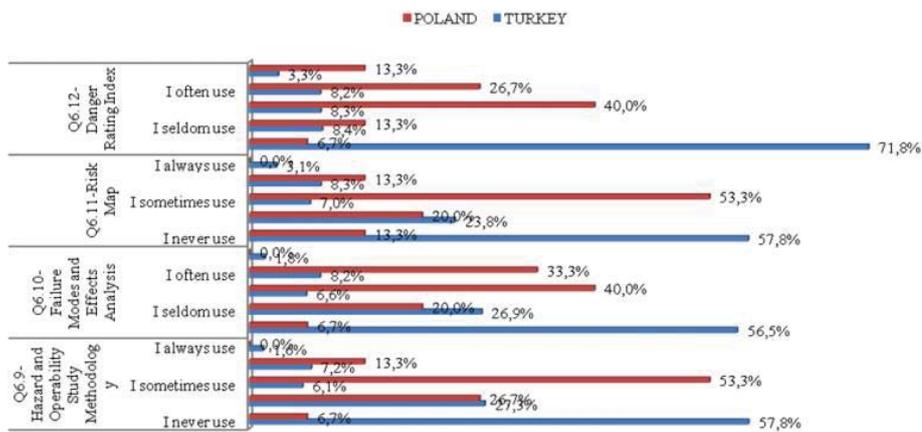


Fig. 12 Answer Rates of the Countries in Survey % (Q6-9:12)

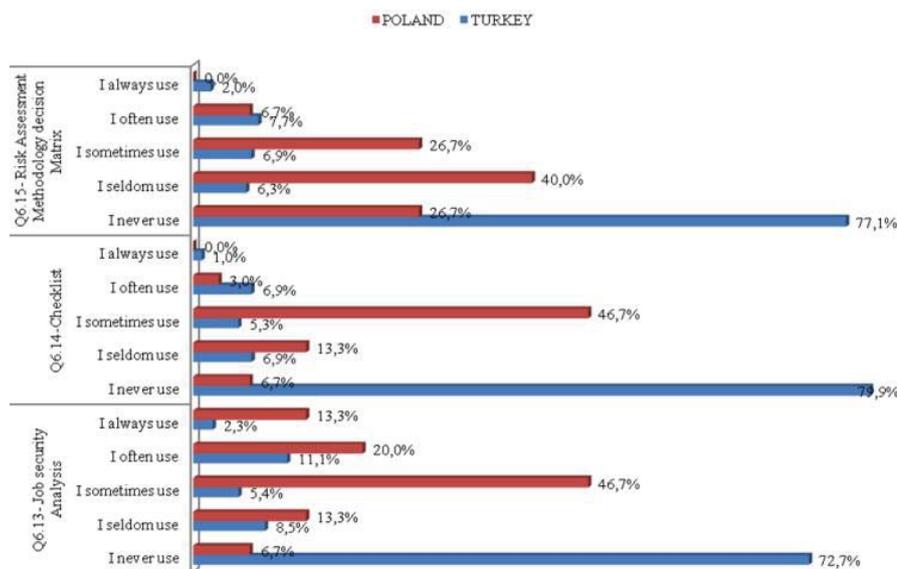


Fig. 13 Answer Rates of the Countries in Survey % (Q6-13:15)

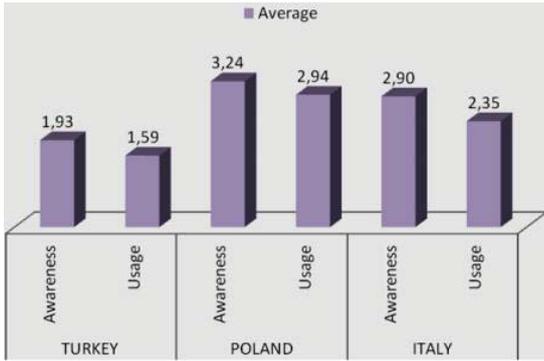


Fig. 14 Risk Analysis Methodology Awareness Average - Mean

Fig. 15 (for Question 7) shows the change demonstrated positive for Italy (60%). As seen in Fig 15 (for Question 8), the question is about if participants have opportunities, what kind of changes are made or if they are willing to make changes about work. Survey is consisted of Semi-Open questions style, and 4 questions are dedicated by experts. 42.4% of them, which is a high rate, was resulted that OHSU facilities are required to offer at least three quarters for fewer than 50 workers working on the company in Turkey. According to the survey; the rate of 48.0% delicate that every 100 C class certification is appointed advisor who has 1A class certification in Italy. 20.0% tells that inspections are started in six month periods in based on sectors in Italy (Fig. 15).

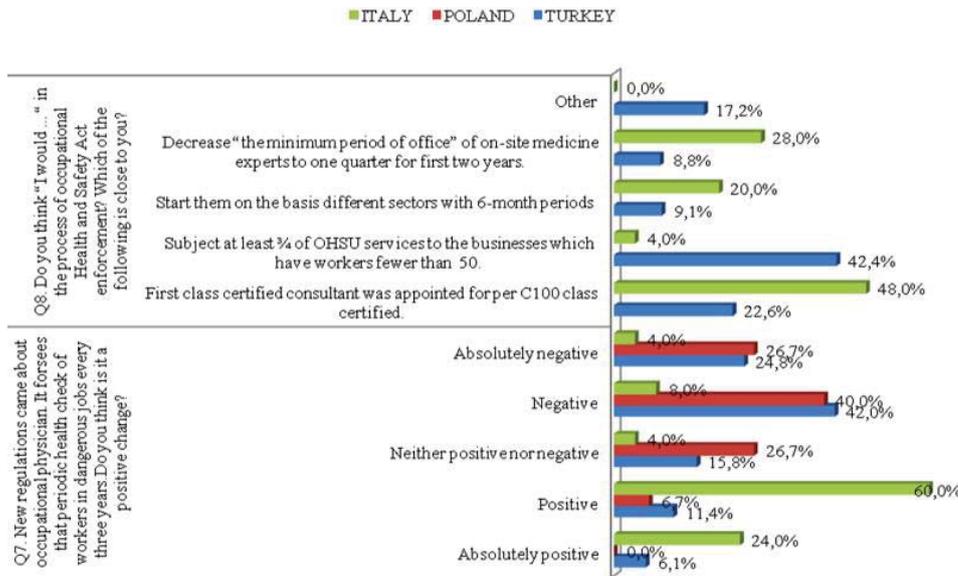


Fig. 15 Answer Rates of the Countries in Survey % (Q7-8)

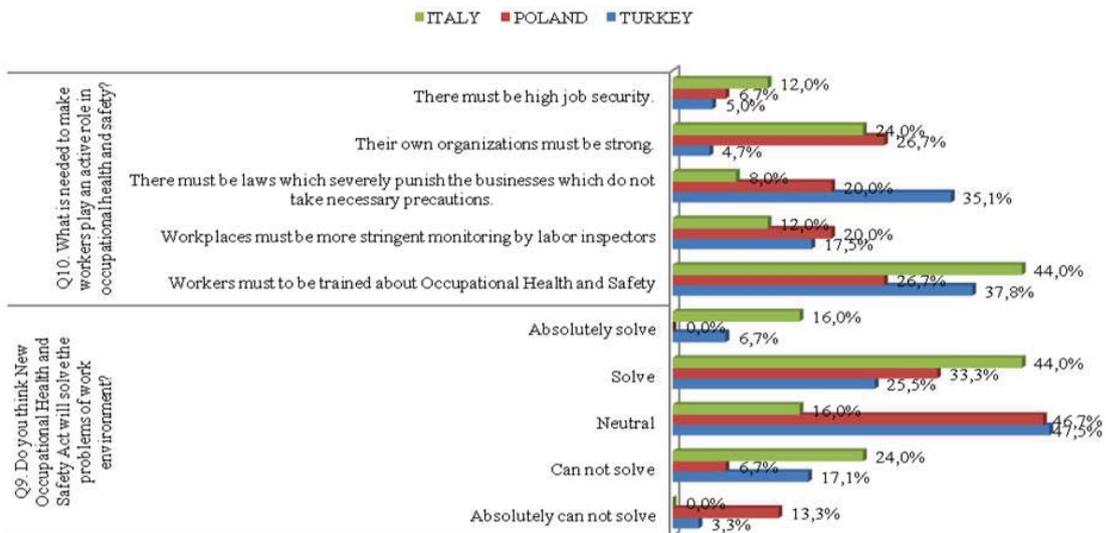


Fig. 16 Work Offices – whether the new job security law solves problems or not on work conditions

According to Question 9, participants are required to delicate whether the new job security law solves problems on work conditions. 47.5% tells that they are neutral in Turkey. 44.0% dedicated that job security solves certain problems on work conditions in Italy. 16.0% dedicated that job security solves certain problems on work conditions in Italy. 24.0% dedicated that job security will not solve certain problems on work conditions in Italy and 13.3% who are negative about job

security delicate that this never solves problems in Poland (Fig. 16).

According to Question 10 “What do occupational health and safety need to play a more active role?” 35.1% remains in front of expression which being given hard punishment to personnel who do not take precautions regarding the job security of law in Turkey. Giving hard punishment is very effective for workers (Fig. 16).

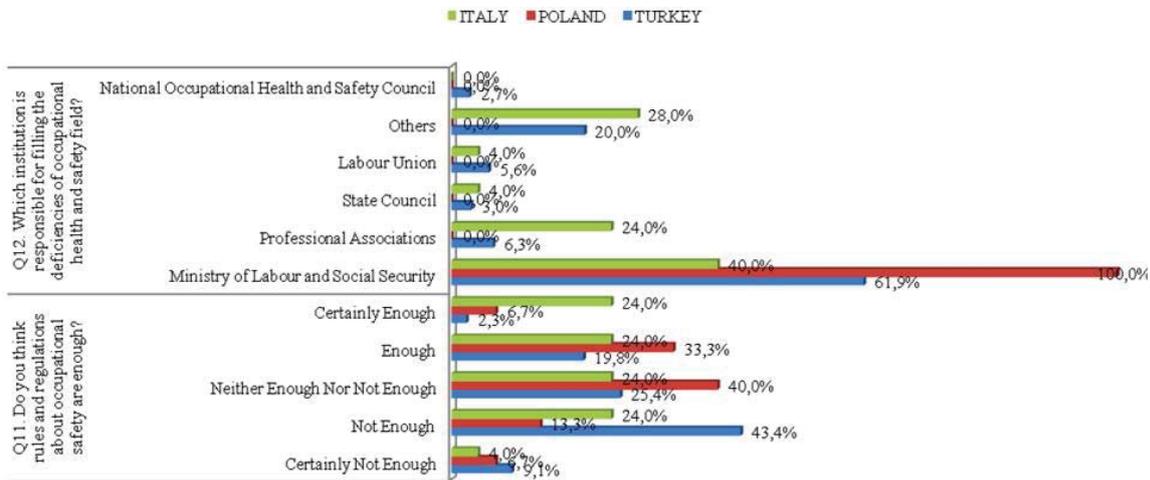


Fig. 17 Answer Rates of the Countries in Survey % (Q11-12)

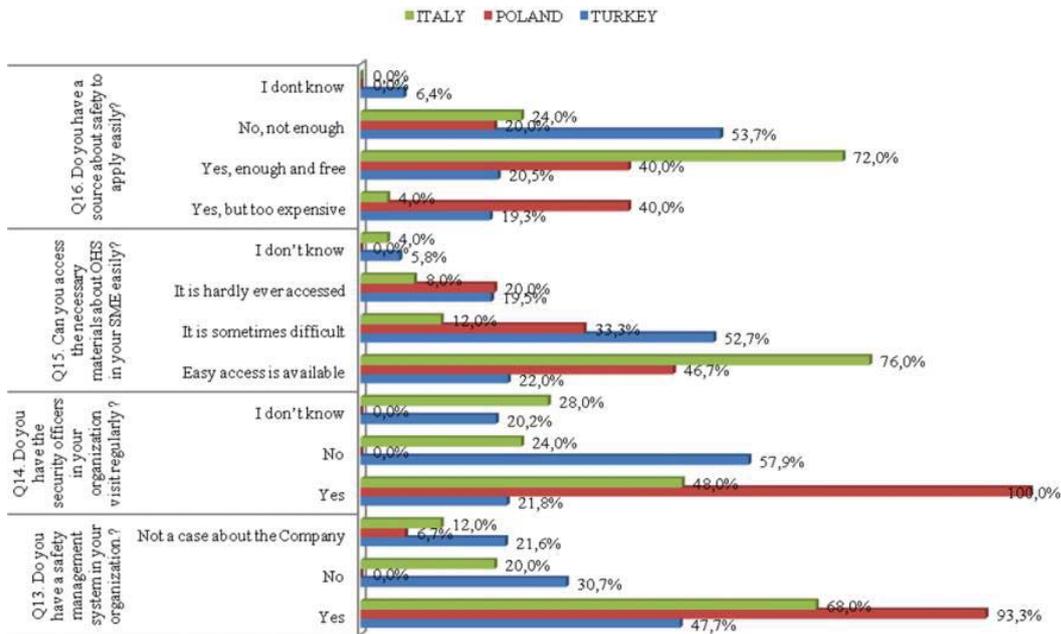


Fig. 18 Answer Rates of the Countries in Survey % (Q13-16)

Question 11: “Do you agree whether job security regulation is adequate or not?” This question aims to answer about five point likert scale. Participants who are “absolutely inadequate” is 9.1% in Turkey, “only inadequate” is the rate of 43.4% in Turkey, “neutral is 40.0% in Poland, “adequate” is 33.3% in Poland and, “absolutely adequate” is 24.0% in Italy (Fig. 17).

As we have shown, the most of the participants complain inadequate job security regulations. It is clear that this field, which will be innovated, is responded positively by employees. Additionally; in question 12 survey asks them which companies are responsible for work health as well as work security. As it is shown Fig. 17, The Ministry of Labour

and Social Security which has the rate of 100.0% is entitled to Poland. National Occupational Health and Safety Council, which has 2.7%, is entitled to Turkey. Professional

Associations which has 24.0% is entitled to Italy. Participants who are responsible for Labour Unions are 5.6% in Turkey. State Council, which has 4.0%, is entitled to Italy.

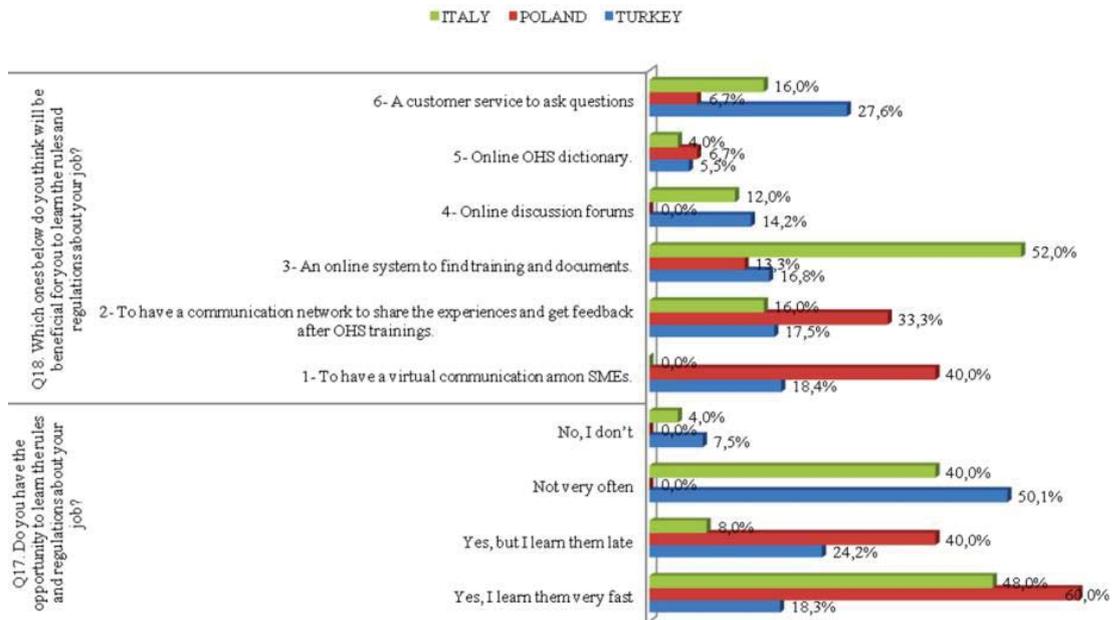


Fig. 19 Answer Rates of the Countries in Survey % (Q17-18)

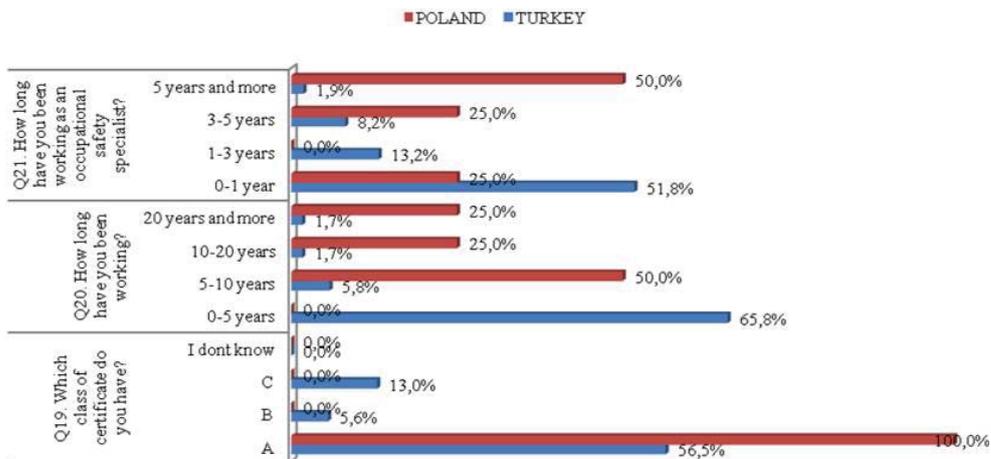


Fig. 20 Answer Rates of the Countries in Survey % (Q19-21)

In Question 13, survey asks whether workers have the safety management system on work places. While 93.3% is telling “Yes” in Poland, 30.7% answers “No” in Turkey (Fig. 18).

Question 14: “Do you have security officers in your organization visiting you regularly?” 57.9% answers “No” in Turkey, 28.0% replies “I do not know” in Italy and 100.0% answers “Yes” in Poland. As a result, they do not think that they are being visited regularly by personnel or security staff. (Fig. 18).

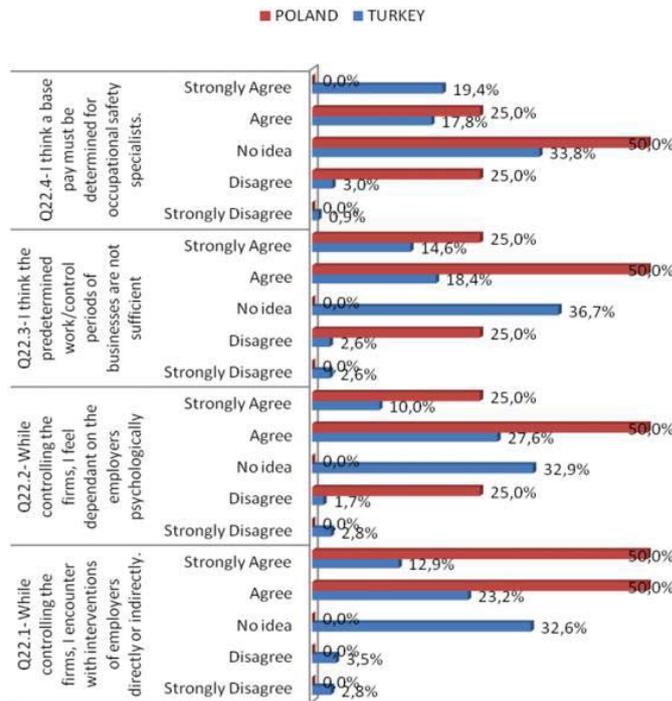


Fig. 21 Answer Rates of the Countries in Survey % (Q22-1:4)

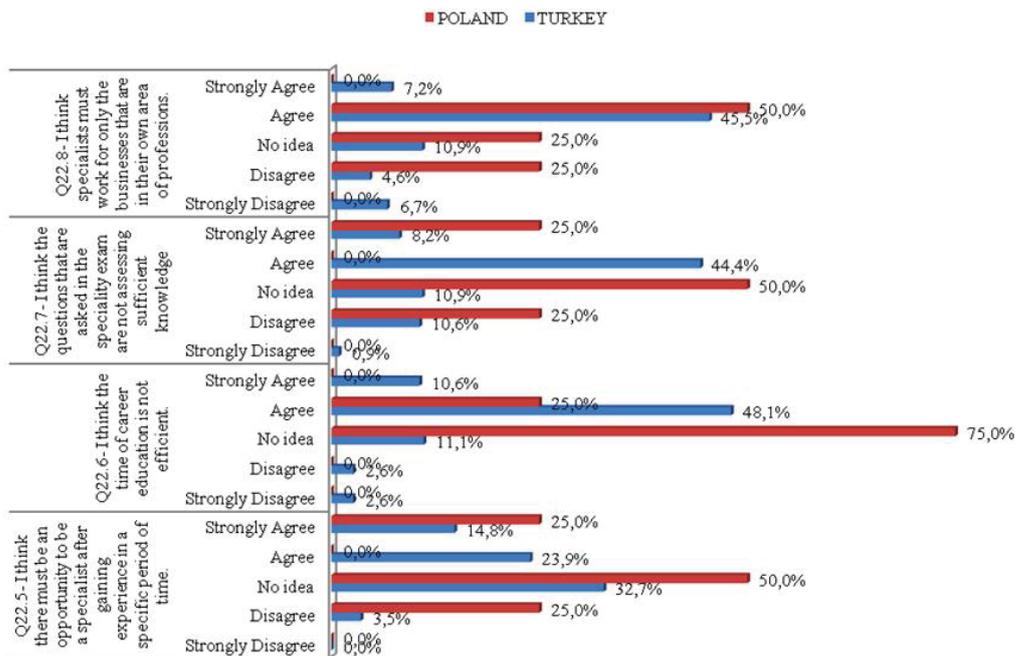


Fig. 22 Answer Rates of the Countries in Survey % (Q22-5:8)

Question 15: “Can you access the necessary materials about OHS in your SME easily?” As an answer, while 52.7% sometimes have difficulties with regard to accessing in Turkey, 20.0% has experiences about access problems in Poland. 76.0% has no difficulties regarding access in Italy (Fig. 18).

Question 16: “Do you have a source about safety to apply easily?” 53.7% of participants complains of inadequate references about security in Turkey. 72.0% of participants emphasizes adequate references and being free in Italy. 40.0% of participants emphasizes adequate references and expensiveness in Poland and Italy (Fig. 18).

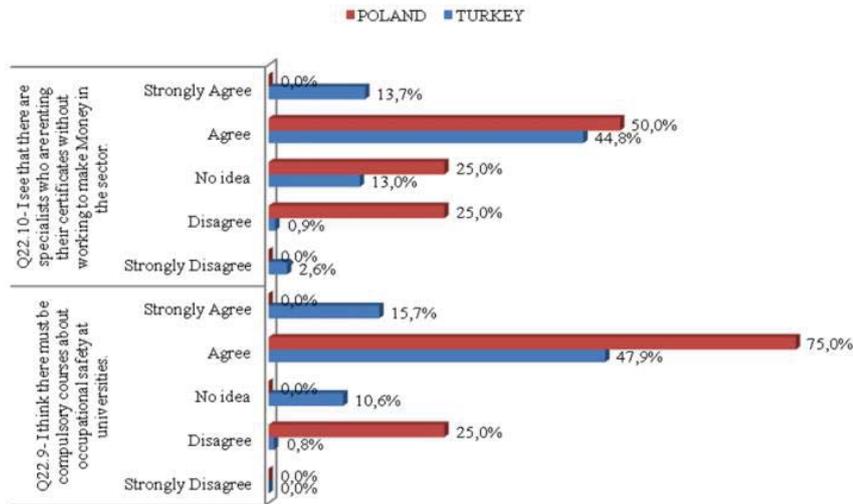


Fig. 23 Answer Rates of The Countries in Survey % (Q22-9:10)

Question 17 “Do you have the opportunity to learn the rules and regulations about your job?” When answers of participants are examined, 50.1% of participants can not learn new regulation about a job in Turkey. Even if 40.0% of participants have a chance to learn information about new regulation they will learn it too late; and also 60.0% of participants have a chance to learn information about new regulation fastly in Poland, and 7.5% of participants says that they never have a chance to learn information in Turkey.

Lastly, question 18 is asked for work offices that “Which of the following do you think would be useful to learn law regulations about the job?” 40.0% of participants take benefit from interacting with a virtual network between SMEs in Poland; 33.3% of participants take benefit from “Communication Network sharing experiences which take OHS educations” in Poland. 52.0% of participants take benefit for “An online system to find training and documents.” in Italy. 14.2% of participants take benefit for “Online discussion forums” in Turkey. 6.7% of participants take benefit for “Online prepared OHS Dictionary” in Poland, and 27.6% participants take benefit for “A customer service to ask questions” in Turkey (Fig. 19).

2. Experts of Occupation Health Problems Office Question Form and Analysis

Experts who have duty about occupational health and security are had an interview and results of analyses are included.

The first question is that experts of occupational health and security are taken information their certification which is a group. 33 Experts who are occupational health and security have an interview in the Ankara. General report is converted percentage over the number of 100.0% of experts who are met in Poland have a class of “A” (Fig. 20).

When we ask for experts as another question 20 how many years is worked in work life, 65.8% of participants work in 0-5 years in Turkey, 50.0% of participants work in 5-10 years in

Poland, 25.0% of participants work in 10-20 years and in more than 20 years respectively in Poland (Fig. 20).

Question 21 is “how many years work as experts of work health?” 51.8% of participants works 0-1 years in Turkey. 13.2% of participants work 1-3 years in Turkey. 25.0% of participants works 3-5 years in Poland. 50.0% of participants works more than five years in Poland (Fig. 20). As last part question 22, ten expressions are dedicated for experts of work health. Experts are wanted to give points as “Strongly Agree-5”, “Strongly Disagree-1.”

The average of answers is 17.5% in Poland and Italy. That is, all answers are positive. While firms are inspected, employers interfere directly or indirectly. It is clear that this problem has to solve gradually. Experts of occupation health improve in the direction of ratings.

III. CONCLUSION

Our study includes three countries. Fig. 24 summarizes the work carried out in the specific cities of Poland, Italy and Turkey. Four distinct forms were applied in Turkey. Safety experts and company were interviewed in Italy and Poland.

| Form                     | Country    |               |           |               |           |               |
|--------------------------|------------|---------------|-----------|---------------|-----------|---------------|
|                          | Turkey     |               | Poland    |               | Italy     |               |
|                          | n          | %             | n         | %             | n         | %             |
| Occupational Expert Form | 61         | 6,9%          | 4         | 21,1%         | 1         | 3,8%          |
| Student Form             | 321        | 36,1%         | 0         | 0,0%          | 0         | 0,0%          |
| Teacher Form             | 93         | 10,5%         | 0         | 0,0%          | 0         | 0,0%          |
| Company Form             | 414        | 46,6%         | 15        | 78,9%         | 25        | 96,2%         |
| <b>Total</b>             | <b>889</b> | <b>100,0%</b> | <b>19</b> | <b>100,0%</b> | <b>26</b> | <b>100,0%</b> |

Fig. 24 Table of Questionnaire Forms

Country based comparison of questions 5 and 6 which asked awareness and usage habits of 15 job security methods and technologies, awareness points for Poland, Italy and Turkey were determined 3.24, 2.90 and 2.03 points respectively out of 5 points. Using same expression, points for Poland, Italy and Turkey were 2.94, 2.35 and 1.75 respectively

out of 5 points. It is seen from the obtained data that the risk measurement methodology is well known and actively used in

Poland and Italy but in Turkey, it is known partially and used in a lower rate.

|   | Italy       |             | Poland      |             | Turkey      |             |
|---|-------------|-------------|-------------|-------------|-------------|-------------|
|   | Awareness   | Usage       | Awareness   | Usage       | Awareness   | Usage       |
| 1- Initial Hazard Analysis                          | 4,13        | 3,07        | 2,93        | 3,13        | 2,01        | 1,72        |
| 2- Quick Rating Methodology                         | 2,20        | 1,87        | 3,80        | 3,00        | 2,08        | 1,72        |
| 3- Event Tree Analysis                              | 2,40        | 2,00        | 3,40        | 3,13        | 1,88        | 1,66        |
| 4- Primary Risk Analysis                            | 3,00        | 2,13        | 3,47        | 3,40        | 2,17        | 1,69        |
| 5- Cause and Effect Analysis                        | 3,20        | 2,40        | 3,60        | 3,20        | 2,16        | 1,90        |
| 6- Security Audit                                   | 3,40        | 3,13        | 4,00        | 2,93        | 2,18        | 1,95        |
| 7- What If?   | 2,40        | 2,40        | 2,33        | 2,53        | 1,73        | 1,53        |
| 8- Fault Tree Analysis                              | 2,33        | 2,00        | 2,87        | 2,67        | 1,90        | 1,70        |
| 9- Hazard and Operability Study Methodology         | 2,80        | 2,20        | 2,87        | 2,73        | 2,00        | 1,77        |
| 10- Failure Modes and Effects Analysis              | 2,20        | 1,93        | 3,27        | 3,00        | 2,12        | 1,84        |
| 11- Risk Map  | 3,73        | 2,87        | 2,93        | 2,67        | 2,12        | 1,86        |
| 12- Danger Rating Index                             | 3,27        | 2,60        | 3,47        | 3,27        | 2,07        | 1,77        |
| 13- Job Safety Analysis                             | 2,80        | 2,13        | 3,60        | 3,20        | 2,23        | 1,89        |
| 14- Checklist                                       | 3,40        | 2,60        | 3,40        | 3,07        | 1,87        | 1,54        |
| 15- Risk Assessment Methodology The Decision Matrix | 2,17        | 1,93        | 2,60        | 2,13        | 1,93        | 1,64        |
| <b>Average</b>                                      | <b>2,90</b> | <b>2,35</b> | <b>3,24</b> | <b>2,94</b> | <b>2,03</b> | <b>1,75</b> |

Fig. 25 Country based comparison of question 5 and six which is asked awareness and usage habits of 15 job security methods and Technologies

For Question 22, in Turkey and Poland safety experts encounter with interventions of employees while controlling the firms, but in Italy almost not. As a result of these effects, safety experts are feeling psychologically dependent on their employers during the inspection. In addition, experts are complained that the time for checking firms is less. Experts in all three countries indicate that base fees must be determined. They thought that the duration of the specialized training in Turkey and Poland was not enough compared to the Italy. Alternative for this case, they give high scores for after gaining experience they can work as expertise. Experts think questions asked in the exam for expertise are not questioning enough information. Experts should be able to work only in the workplace in their professional fields that have high scores in Poland and Turkey but this ratio is slightly lower in Italy. At all three countries have given highest score for the idea that in the university edition there must be courses which include safety issues. Experts working in Turkey said that there are some experts hired their certificates for money and emphasizes that they are suffering from this condition.

#### ACKNOWLEDGMENT

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