

# Researching the Satisfaction Levels of Passengers for Security Services at Airports

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## Abstract

The rapid development in international trade has directly affected the air transport industry. Therefore, the number of passengers and the amount of cargo carried are increasing every year. Especially for long distance travels, passengers tend to prefer air transport. So, effective security applications at airports such as security processes, the competence of the technology used and security staff are extremely important. At the same time, having good performance of security systems may also affect the passengers' satisfaction. In this study, the effect of security practices at airports on passengers' satisfaction was investigated.

Within the scope of the study, 536 questionnaires were applied both face to face and online to the passengers using Turkish airports. The data were tested using T-Test, ANOVA and Regression analysis. According to the analysis results, it has been found out that there is a meaningful relationship between the evaluations of the passengers towards security services at the airports and their satisfaction level. Also, evaluations of the passengers towards security services at the airports and their satisfaction level differ according to the flight frequency. Finally, some suggestions have been made to the sector administrators related to the security practices at airports in order to increase the passengers' satisfaction level.

**Keywords:** Turkish aviation industry, airport security, passenger satisfaction

## 1. Introduction

The order of importance of human needs has changed worldwide; Economic, political, technological and socio-cultural developments, as well as the protection of human life have become more important. It is seen that unlawful acts are relatively fewer in countries that are aware of this situation and have taken measures against these matters. However, factors such as the development of technology, weapon possibilities, live bombs, aircrafts that can be converted into guns make the terrorist methods more widespread and more global (Ateş et al., 2016). Unlawful actions can also affect the aviation industry negatively.

Therefore, security has become a major factor in aviation sector. In recent decades, the number of threats to aviation security has increased significantly. This has led to even more strict security regulations as the threats evolve. Security procedures have become exceedingly complex and invasive to passenger privacy. At the same time, passenger and cargo traffic are expected to double in the next 15 years. According to the International Air Transport Association (IATA), 40 billion passengers around the world will prefer air transport by the end of 2017 (IATA, 2016). Again, according to IATA, the growth rate of global air transport by 2035 is 3.7 % annually on average (IATA, 2016). According to the data provided by the General Directorate of State Airports Authority (DHMI) in December 2016, 174 million passengers were transported by airline companies in Turkey in 2016 (DHMI, 2016). As to another forecast, the Turkish air transport sector will grow at an annual average rate of 4 % until 2021 (Eurocontrol, 2015). It is clear that the current complex security system cannot be adapted to such a growth. It will increasingly become a major market restraint (Comprehensive European Approach to the Protection of Civil Aviation—COPRA, 2017).

Thus, every country and every business have to manage the security process properly. Safety management is part of the general management activities of aviation companies and represents the whole range of procedures and practices that contribute to the overall safe operation of aviation operations (Directorate General of Civil

Aviation—DGCA, SHT-17.3).

Airports are complex industrial investments, where different elements are assembled and activities are carried out to facilitate the exchange between air and ground transportation (Ateş, 2008). In airports, which have an important place in the aviation system, it is very important for the security services to be established and operated effectively, to operate the system efficiently and for passenger satisfaction. In international literature, the number of research on aviation security services is relatively high (Eboli & Mazzulla, 2009; Fodness & Murray, 2007; Enoma & Allen, 2007; Bezerra & Gomes, 2015; Kim et al., 2017; Jiang & Zhang, 2016; Suárez-Alemán & Jiménez, 2016; Ali et al., 2016; Gitto & Mancuso, 2017; Sakano et al., 2016; Wattanacharoensil et al., 2017; Alards-Tomalin et al., 2014; Pantouvakis & Renzi, 2016; Bogicevic et al., 2016; Mikulic & Prebežac, 2008; Prebezac et al., 2010; Gkritza et al., 2006; Perng et al., 2010; Bogicevic et al., 2013). However, the number of research on aviation security services in national literature is relatively low (Tuncer & Gavcar, 2014; Ateş et al., 2016). Especially the research on the effect of aviation security services on passenger satisfaction is not sufficient. Therefore, in this study, the effect of security services offered at airports on passenger satisfaction has been searched.

## 2. Conceptual Background and Research Model

### 2.1 Security Services at Airports

Airports take various measures for the security of passengers. In order for security measures to be implemented properly, it is necessary to understand what security is. In this context, International Civil Aviation Organization (ICAO) defines security as: “Safeguarding civil aviation against acts of unlawful interference and this objective is achieved by a combination of measures and human and material resources” (Annex, p. 17). As it is clear from the description, security is not limited to personnel and technological systems but includes measures to be taken. In order to achieve this integrity, security checks must be of high quality. Security control is defined as follows; “A means by which the introduction of weapons, explosives or other dangerous devices, articles or substances may be used to commit an act of unlawful interference can be prevented” (Annex, p. 17).

According to another definition, aviation security refers to the prevention of acts of unlawful interference against civil aviation, such as seizure of an aircraft or placing a hazardous device on-board an aircraft (European Commission, 2017). Aviation security is costly and controversial; No other security measures directly affect such a large portion of the country’s population (Jenkins, 2012). Due to the increasing demand for air transport, passengers will be directly and significantly affected by security services.

The strategy document consists of three primary categories of threats against the aviation domain based on the target of the threat. These include threats involving aircraft, threats to aviation infrastructure and threats involving hostile exploitation of air cargo. A variety of tactics may be used to attack these targets, including hijackings, bombings, shootings, and criminal tactics such as smuggling of persons and weapons. A synopsis of the relationship among threat origins or sources, aviation targets, and tactics for attacking these aviation targets is presented in Figure 1 (Elias, 2009).

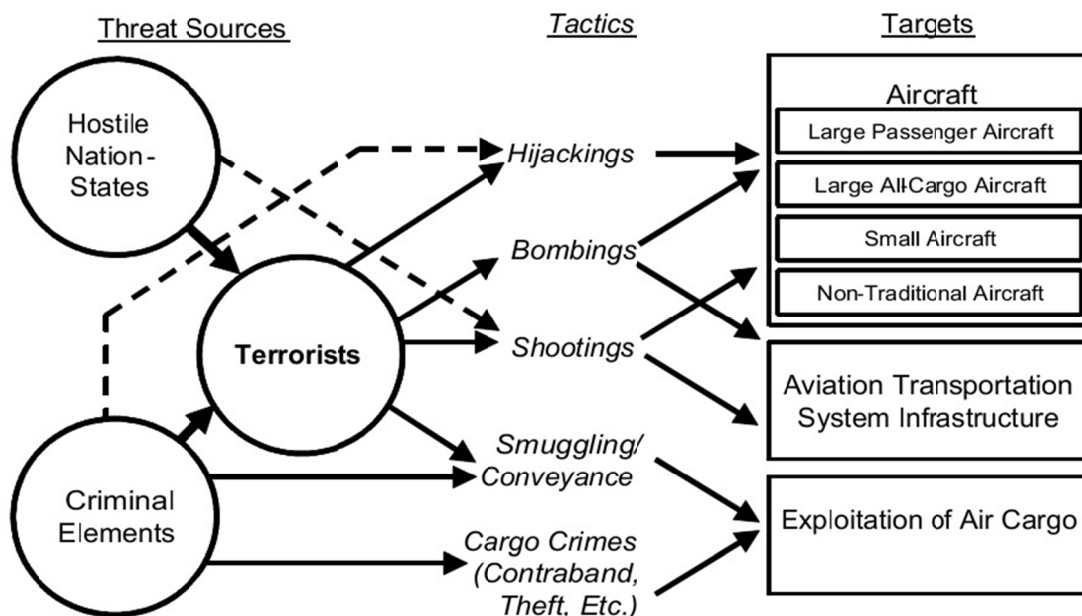


Figure 1. Aviation security threat sources, tactics, and targets

## 2.2 Passenger Satisfaction at Airports

It is important to understand the importance of safety in aviation and to make it sustainable by analysing the effect on passenger satisfaction (ICAO, 2017). Recently, passengers' complaints about the security services seem to be increasing. In particular, the number of security checkpoints, the staff's attitude and the differences on the sensitivity of devices cause the passengers to experience various problems. Furthermore, different security practices at different airports may also have negative effects on passenger's satisfaction (Ateş et al., 2016).

The most comprehensive definition of satisfaction has been offered by Kotler & Keller (2006) who define satisfaction as "person's feeling of pleasure or disappointment which resulted from comparing a product's perceived performance or outcome against his / her expectations". Passengers are customers of the companies involved in the aviation sector and their satisfaction is of utmost importance for the sustainable success of the industry. There are many factors that affect the satisfaction of passengers, and the quality of security services is one of these factors.

According to Bezerra & Gomes (2015), there is a relationship between security services offered at the airport and passenger satisfaction. Gkritza et al. (2006) have found that waiting times at security screening points are an important determinant of passenger satisfaction.

Perng et al. (2010) found that satisfaction with security officers was influential on passenger satisfaction. In a similar study (Tuncer & Gavcar, 2014); police officers' controlling passports being effective, the security personnel's being polite, the security checks' being sensitive, the police officers' being courteous and helpful, security check layovers' being low, passport controls' being fast all have important effect on passenger satisfaction. In addition, Bogicevic et al. (2013) stated that problems experienced in security-check are one of the main factors causing passenger dissatisfaction. Moreover, security process can cause time stress which, would be a large determinant of anxiety (Bogicevic et al., 2016). Therefore our first hypothesis is;

**H1:** *There is a significant relationship between security services at airports and passenger satisfaction.*

Our other hypotheses and proposed research model are as follows:

Table 1. Research hypotheses

H2a	Passengers' evaluations about security services offered at airports differ significantly according to gender.
H2b	Passengers' evaluations about security services offered at airports differ significantly according to age.
H2c	Passengers' evaluations about security services offered at airports differ significantly according to occupations.
H2d	Passengers' evaluations about security services at airports differ significantly according to the level of education.
H2e	Passengers' evaluations about security services offered at airports differ significantly according to flight frequency.
H3a	Passengers' satisfaction level differs significantly according to gender.
H3b	Passengers' satisfaction level differs significantly according to age.
H3c	Passengers' satisfaction level differs significantly according to occupations.
H3d	Passengers' satisfaction level differs significantly according to the level of education.
H3e	Passengers' satisfaction level differs significantly according to flight frequency.

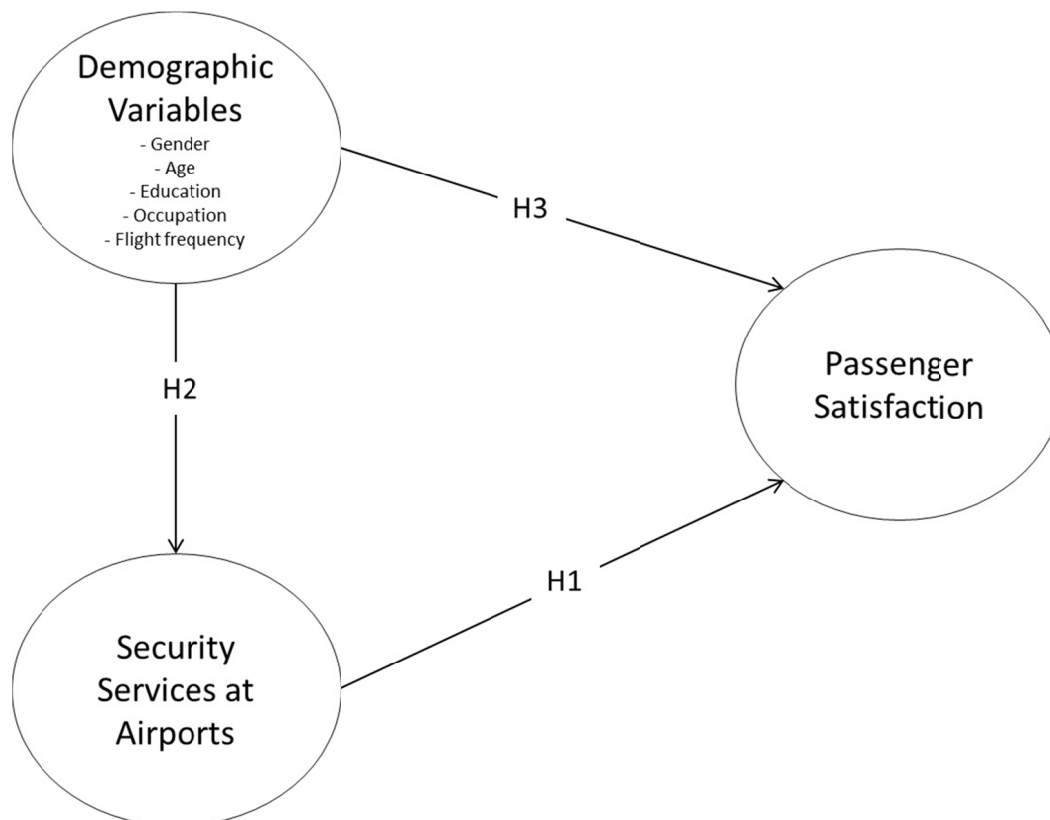


Figure 2. The proposed research model

### 3. Methodology

#### 3.1 Measures of the Constructs

The questionnaire used in the survey consists of 2 parts. In the first part, questions about the evaluations about security services offered at the airports of the passengers and their satisfaction with these services were included. In the creation of these questions, the ICAO Annex 17 document was used. These questions are prepared with a 5-point Likert scale and answers were collected as follows; (1) I absolutely disagree. (5) I absolutely agree. In the second part, there are questions about the demographic characteristics and flight information of the passengers.

In addition to the questions about security services offered at the airports, in order to learn the opinions of the passengers about the security measures taken during the flight, two questions which were prepared on the 5-point Likert scale were asked; "There must be a security officer on airplanes" and "There must be a safety camera on airplanes".

#### 3.2 Data Collection and Sample Design

Within the scope of the research, internet and face-to-face surveys, by using the convenience sampling method,

were applied to the passengers benefiting from the airport services in Turkey. Prior to the implementation of the survey, 50 pilot tests were conducted to improve data quality and increase the reliability of the questions. After making the necessary adjustments to the questions, the questionnaire was applied to 536 people between December 2016 and January 2017. After invalid questionnaires were issued, 500 valid questionnaires were analysed.

### 3.3 Data Analysis

For analysis of the data; Regression Analysis, T-test and ANOVA, which are parametric tests, were applied. Frequency tables were formed in the analysis of demographic data. A reliability analysis was conducted on the questions regarding the security services offered at the airports and the satisfaction of the passengers with these services. As a result of the analysis, the Cronbach Alpha Coefficient was calculated as 0.73 for security services and 0.78 for satisfaction (Nunnally, 1978).

## 4. Results

When the demographic information in Table 2 is examined, it was seen that 84% of the participants were male and 16 % were female. The age group in which participants are most frequently included is 35 years or less (74%), and 87% has a university or higher education level. Passengers participating in the survey consisted of students (33%), private sector workers (32%) and public employees (29%). 62% of the responders fly at a low frequency (1-5 times a year), 12% at a moderate frequency (6-10 times a year) and 18% at a high frequency (16 times a year and over).

Table 2. Demographic variables

	Frequency	Percent (%)
Gender		
Female	420	84
Male	80	16
Age		
15-25 years	229	46
26-35 years	142	28
36-46 years	107	21
46-55 years	14	3
56 years and above	4	2
Education		
High school	63	13
University degree and above	437	87
Occupation		
Civil servant	146	29
Private sector employee	160	32
Artisan	6	1
Housewife	6	1
Student	164	33
Unemployed	18	4
Flight frequency		
Low-frequency	312	62
Medium-frequency	61	12
Frequent-frequency	89	18
Other	38	8
Total	500	100

Simple Regression analysis was applied to reveal the relationship between passenger satisfaction and safety services provided to the passengers at the airports. Passengers' evaluations and satisfaction levels of security services provided at the airports of the passengers were analyzed using T-Test and ANOVA analysis methods depending on their demographic characteristics.

It has been searched whether there is a relationship between passenger satisfaction and security services offered to the passengers at the airports. The results for the regression analysis are as in Table 3.

Table 3. Regression results

Model	Standardized Coefficient ( $\beta$ )	t-value	Sig.
Passenger Satisfaction			
Constant	-	15.438	.000
Security Services at Airports	.586	16.134	.000

Note.  $R^2 = 0.343$ ; F-value = 260.296; df = 1, 498; Adjusted  $R^2 = 0.342$ ; Significance=0.000.

As a result of the simple regression analysis, It has been seen that security services are a meaningful explanatory of passenger satisfaction.  $R = 0.586$ ,  $R^2 = 0.343$ ,  $F(1, 498) = 260.296$   $p < 0.05$ . It can be stated that 34% of the total variance towards passenger satisfaction is explained by the security services offered to the passengers at the airports. Therefore, H1 hypothesis has been accepted.

The results of the analysis of the evaluations about security services provided at the airports of the passengers and the satisfaction level of these services according to their flight frequency are presented in Table 4.

Table 4. ANOVA results

		Sum of Squares	df	Mean Square	F	Sig.	Significant Difference
F1	Between Groups	7.737	6	1.289			
	Within Groups	170.528	493	.346	3.728	.001	1-2, 1-3
	Total	178.265	499				
F2	Between Groups	13.633	6	2.272			
	Within Groups	428.832	493	.870	2.612	.017	3-1, 3-2
	Total	442.465	499				

F1: Security Services F2: Satisfaction 1: Low-frequency 2: Medium-frequency 3: Frequent-frequency.

Passengers' evaluations about security services provided at the airports show a significant difference according to the flight frequency,  $F(6, 493) = 3.728$ ,  $p < 0.05$ . Hence, H2e is accepted. According to the results of the Scheffe test conducted to determine which groups differ in flight frequency; there was a significant difference between evaluations of low-frequency flying passengers (3.41), moderate frequency (3.26) and frequent flying (3.19) evaluations about security services at airports. It has been seen that frequent flyers are at the lowest level of evaluations about security services offered at airports. According to the gender, age, occupation and education level of the evaluators of the security services provided at the airports of the passengers, it was determined that there was no significant difference ( $p > 0.05$ ). For this reason, H2a, H2b, H2c and H2d have been rejected.

The satisfaction level of passengers related to the airport security services was found to be significantly different according to flight frequency,  $F(6, 493) = 2.612$ ,  $p < 0.05$ . So, H3e was accepted. According to this, it is determined that there is a difference between frequent flyers (3.19) and satisfaction levels of moderate (3.36) and low (3.40) frequent passengers. No significant difference was found between moderate frequency and low-frequency flyer satisfaction levels. It has been found that frequent flyers have the lowest level of satisfaction, while low-flying passengers have the highest level of satisfaction. The satisfaction level of passengers did not show any significant difference ( $p > 0.05$ ) according to sex, age, occupation and education levels. H3a, H3b, H3c and H3d have therefore been rejected. The final model obtained in the direction of the analysis results is given in Figure 3.

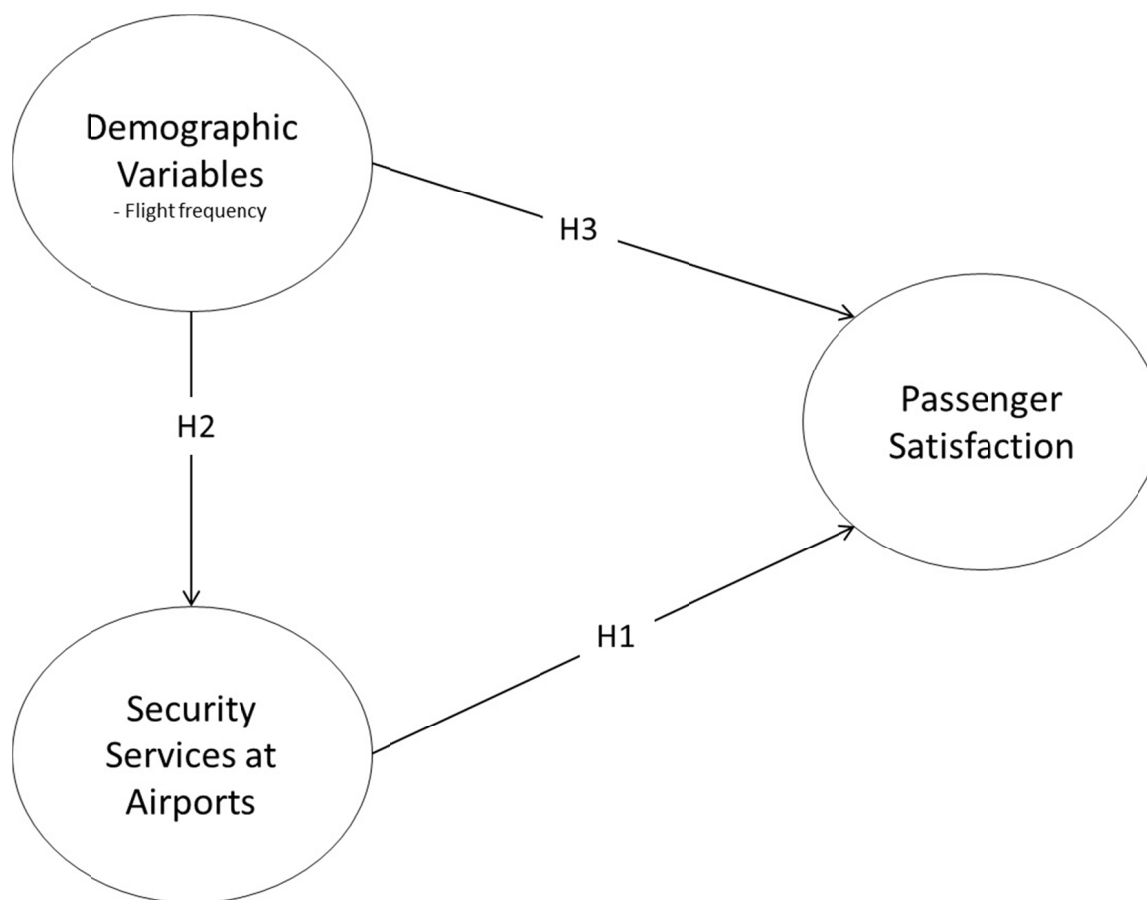


Figure 3. Final model

Passengers' overall evaluations about security services offered at the airports and their satisfaction level with these services were examined with the help of descriptive statistics on a factor basis and the results are presented in table 5.

Table 5. Security services provided at airports and evaluation of satisfaction levels for these services

	N	Minimum	Maximum	Mean	Std. Deviation
Security Services at Airports	500	1.00	5.00	3.3758	.59770
Passenger Satisfaction	500	1.00	5.00	3.3980	.94165

As seen in Table 5, it is observed that the passengers' general assessments of the security services provided at airports and their level of satisfaction with these services were collected around the value of "3", corresponding to the expression "Indecisive". It can be said that passengers have some hesitations about the security services offered at the airports and their satisfaction levels are moderate.

In addition to the questions about security services offered at the airports, passengers were asked about the security measures taken during the flight. 75 % the passengers answered that there must be security officers on the plane. Moreover 85 % of them indicated that there must be security cameras in the aircraft during the flight.

## 5. Discussion and Conclusion

In this study, passengers' evaluations about security services offered at airports and their satisfaction level has been searched. When the demographic information of the participants is examined, it is seen that most of the passengers are male, young, have a higher education level and the majority are university students and private sector employees. The flight frequency of passengers is no more than 1-5 per year.

It has been determined that there is a significant relationship between the evaluations of passengers about the

security services offered at airports and their satisfaction with these services. Also security service is a meaningful explanatory factor on the passenger satisfaction. This result is supported by previous applied in different countries and airports (Bezerra & Gomes, 2015; Gkritza et al., 2006; Perng et al., 2010; Tuncer & Gavcar, 2014; Bogicevic et al., 2013; Chen et al., 2015; de Barros et al., 2007; Sakano et al., 2016). However, in future studies, other factors affecting passenger satisfaction at airports should be studied to improve passengers' satisfaction level.

According to another result obtained in the research; it has been determined that evaluations of passengers about security services offered at airports and their satisfaction with these services show a significant difference according to flight frequency. Particularly frequent flying passengers' evaluations and satisfaction levels for security services offered at airports are lower than medium and low frequency passengers. Therefore, in order to increase the satisfaction level of the passengers who use the air transportation intensively on their journeys, the expectations, requests and complaints about the security services should be taken into consideration and it will be very effective to provide faster and more reliable services especially with the help of devices containing new technologies. Frequent flying passengers generate more revenue and are time-sensitive than other groups. So if the aviation companies provide security and passport services in a shorter time and security personnel behaves more attentive to these passengers, these may contribute to increase the satisfaction level of them.

In addition, it is known that the human factor is the basis of the vast majority of security problems experienced in the aviation sector. Hence, it is extremely important to support the competencies, authorities and responsibilities of the staff working at the airports (Ateş et al., 2016). What is more, in order to increase passengers' satisfaction level about security services, all security personnel should have some important characteristics such as acting positively and professionally towards passengers, communicating well with them, speaking foreign language/languages and using sign language. Also, especially police officers should perform the passport controls effectively, be sensitive during security checks and finish the passport control procedures swiftly (Tuncer & Gavcar, 2014).

Passengers also want to feel safe during the flight. Therefore, in this study, questions were asked about whether there should be a security officer (police) and security camera during the flight. Most of the passengers gave positive responses to these questions. Thus it is important for the private and public institutions in the sector to take the necessary measures and implement them as soon as possible. The application of mandatory security cameras during the flight should be implemented in the aviation sector. In addition to security cameras, the presence of security personnel applied during some flights in countries such as the US and Israel (Annex, p. 17) may be effective in reducing security problems. It is also of utmost importance that in the future, ICAO should make such obligations and standardizations about security practices. Such practices are also necessary to increase passenger satisfaction. In other words, aviation companies must provide effective security measures during travel cycle as a whole. Otherwise, the entire aviation system will be damaged and passengers will be able to choose other modes of transportation (such as highways, high-speed trains, sea routes), especially for short and medium haul travels.

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