Acta Avionica
Volume XXVII, 52 – No.1, 2025, DOI: 10.35116/aa.2025.0004

PSYCHOLOGICAL IMPACT AND PERCEPTION OF BOMB THREATS AT KOSICE AIRPORT

Luboš SOCHA*, Peter HANÁK, Laura BÁLINTOVÁ
Faculty of Aeronautics, Technical University of Košice, Rampová 7, Košice
**Corresponding author.* E-mail: lubos.socha@tuke.sk

Abstract. This study investigates the psychological impact of bomb threats on passengers and airport staff at Košice International Airport. Considering the evolving nature of terrorism, including cyber threats and false bomb alerts, aviation security remains a critical focus. Using a cross-sectional questionnaire survey, data were collected from 97 passengers and 36 employees to assess perceptions of safety, readiness for crisis situations, and awareness of security procedures. The findings reveal high levels of perceived safety but also significant emotional responses among passengers and stress-related effects among staff, particularly due to repeated false alarms. While most employees feel adequately trained, the study highlights gaps in public awareness and internal preparedness. The results support the need for enhanced crisis communication, targeted training, and psychological support programs. These measures are vital for strengthening resilience and response capacity in the face of modern security threats at airports.

Keywords: airport security; bomb threats; psychological impact; crisis management; aviation safety; emergency preparedness; passenger perception; staff training.

1. INTRODUCTION

Terrorism is one of the most serious security threats today, affecting not only political and social structures but also the daily lives of civilians. While in the past terrorism was primarily viewed as an isolated issue of individual states, it now has a clear global dimension and requires international cooperation along with a comprehensive legal framework [8]. This framework consists of international treaties, resolutions, and laws aimed at preventing and combating terrorist attacks. Its goal is not only to eliminate terrorist groups but also to limit their influence, resources, and ideology, all while respecting human rights. Despite these efforts, terrorist threats remain a significant concern today. The motivation for attackers to carry out terrorist acts often stems from a combination of psychological, social, and ideological factors [6]. Common motivations include religious, political, or racial reasons, vandalism, destruction of symbolic targets, extortion, frustration, or a desire for media attention. A common feature of all forms of terrorism is the attempt to intimidate the public, influence the political environment, and attract media coverage. Terrorists often exploit elements of surprise, target vulnerable locations, and heavily rely on media coverage of their actions.

Aviation is among the most sensitive sectors, where a single terrorist incident can trigger a global response. Attacks on aircraft and airports have been occurring since the 1960s, including hijackings, bombings, airport shootings, and assaults using hidden explosives, rockets, or firearms. The 9/11 attacks marked a significant turning point, leading to the worldwide tightening of security measures [5]. These measures included the introduction of detection screenings, reinforced cockpit doors, liquid restrictions, facial recognition technologies, and stricter monitoring of passengers and luggage.

It is also important to recognize that terrorism evolves alongside technological advancements, shifting from centralized organizations to individuals, utilizing modern tools, and adapting methods to exploit specific vulnerabilities. In addition to traditional threats such as bombings or hijackings, new dangers have emerged, including cyberterrorism, misinformation campaigns, and drone misuse [8]. Airports are frequent targets due to their symbolic and infrastructural significance. They may face actual attacks that paralyze air traffic or damage control and navigation systems, as well as repeated false bomb threats intended to spread panic. These threats are often disseminated via the internet or

anonymous emails, as observed in Slovakia in 2024 at airports in Bratislava, Košice, Poprad, and Nitra.

Such incidents cause serious disruptions, financial losses, and negative psychological effects on both employees and travellers. Therefore, the continuous modernization of security technologies is essential, including advanced X-ray and explosive detectors (e.g., EDSCB systems), automated decision-making algorithms during checks, employee training, and compliance monitoring. Effective and cost-efficient security procedures are key to maintaining sustainable aviation security [4]. For this reason, our study focused on assessing the psychological impacts of bomb threats on passengers and airport staff.

2. METHODOLOGY AND DATA COLLECTION

The aim of this study was to evaluate the impact of bomb threats on the subjective perception of safety among passengers and employees at Košice International Airport. The research was designed as a cross-sectional study using a questionnaire survey tailored to the specific characteristics of each respondent group.

To obtain relevant quantitative data, two questionnaires were developed: one for passengers and one for airport employees.

In designing the passenger questionnaire, the questions focused on gathering information about how passengers perceive airport security measures, their experiences flying in crisis situations, and their knowledge of procedures during bomb threats. This questionnaire was distributed online via a form shared among aviation students and their family members. The goal was to reach a population that regularly or occasionally uses air transport.

For the employee questionnaire, the questions aimed to assess the preparedness of staff to handle crisis situations, the quality of training provided, experiences with both false and real threats, and the psychological effects of such incidents. This questionnaire was distributed directly to airport staff across various departments.

Both questionnaires included a combination of closed (scaled) and open-ended questions. The closed questions were analysed statistically (using frequencies, proportions, and correlations), while open responses provided a deeper interpretation of the quantitative results. Variables such as gender, age, travel frequency (for passengers), job position, and length of service (for employees) were considered in the analysis.

The primary goal of this approach was to collect relevant quantitative data on safety perception, crisis preparedness, and awareness levels among these two key groups—passengers and airport employees.

The research instrument was inspired by previous studies [1], [2], [3] on aviation security perception and was adapted to the specific conditions of Košice Airport.

3. RESULTS OF THE QUESTIONNAIRE SURVEY

The total number of respondents who participated in the survey was 97 passengers and 36 employees. Data were collected between February and March 2025 and subsequently analysed using basic statistical methods and content analysis of open-ended responses.

3.1. ANALYSIS OF THE PASSENGER QUESTIONNAIRE RESULTS

Of the total respondents in the passenger security perception survey, 64% were women, 34% men, and 2% identified as another gender. The majority (61%) were young adults aged 18–25. This age group generally exhibits higher digital literacy, is more informed, and is less prone to panic compared to older travellers. However, they may also be more critical of privacy intrusions, a point that was reflected in some responses related to security checks.

Regarding travel frequency, most respondents (60%) indicated they travel by air only very rarely. Furthermore, 76% stated they primarily use air transport for holiday purposes. This can influence their familiarity with the airport environment and shape their attitudes. Despite limited experience, 82% of respondents reported feeling safe at the airport, indicating a high level of trust in security measures.

Security procedures were viewed positively by 75% of respondents. This sentiment was also reflected in their responses about discomfort during security checks—over half (59%) reported no issues with security controls and accepted them as necessary. About 20% found the checks unpleasant, which may be due to privacy concerns or negative personal experiences.

Interesting insights emerged from a question regarding reactions to a bomb threat. Nearly 82% of respondents reported feeling nervous, stressed, or afraid. Only 4% said they would remain completely calm. These responses suggest that in such situations, the public is likely to have a strong emotional reaction, underscoring the importance of effective crisis communication by the airport.

Concerns about possible bomb attacks were expressed by approximately 31% of respondents, indicating a perceived risk. More than half (53.5%) stated they were not worried but acknowledged the potential threat, while another 15.5% did not feel threatened at all. This demonstrates a general trust in the airport security system, although a portion of respondents still experiences some level of uncertainty.

Nearly 48% positively evaluated the airport staff's ability to handle crisis situations, while 39.4% were unsure. This may indicate a lack of information or limited interaction with staff during travel. Increased transparency and public awareness could help address this issue.

More than 70% of respondents expressed at least occasional concern about the safety of their personal belongings at the airport. This may reflect a general distrust of public spaces or insufficient awareness of theft prevention measures. Conversely, awareness of airport security measures was mostly rated positively, although about 18% viewed this area as weak.

In open-ended responses, many respondents suggested improvements such as more frequent checks, increased presence of security personnel (e.g., police, sniffer dogs), more spacious airport layouts, and enhanced technical security measures. While passengers generally perceive airport safety positively, these suggestions indicate that there is still room for improvement in comfort, space, and technological protection.

3.2. ANALYSIS OF THE EMPLOYEE QUESTIONNAIRE RESULTS

The demographic composition of the respondents consisted of 61% men and 39% women. Over 60% of the participating airport employees were aged 18–25, and as many as 78% had worked at the airport for less than five years. This suggests that the workforce is relatively young and inexperienced, which may influence their confidence and psychological readiness to handle stressful situations. On the other hand, younger employees may be more adaptable and open to learning new procedures and technologies.

From the perspective of perceived safety, the results can be considered positive. The majority of employees (89%) reported feeling safe in their workplace. This sense of security was reflected in their assessments of security measures, with more than 85% considering them sufficient. Additionally, employees indicated that further strengthening of security measures would enhance their sense of safety, suggesting there is still room for improvement in this area.

Reactions to bomb threat scenarios revealed that 47% of employees experience stress or tension in connection with such threats, although only a small group (22%) found these situations to be extremely psychologically demanding. In the event of a reported bomb threat, the majority of respondents (86%) felt prepared to act quickly and confidently. Nonetheless, around 14% expressed that they would not trust themselves to handle the situation, highlighting the need for more targeted training focused on stress management and practical crisis response.

Interesting findings also emerged regarding mental health. More than half of the employees admitted that false bomb threats had a psychological impact on them, ranging from mild tension to significant anxiety. Furthermore, 14% experience stress at work on a regular basis. These results

underscore the necessity for systematic mental health support, such as psychological consultations, supervision, or peer support.

One of the key areas identified is the training of staff in response to bomb threats. Although over 77% of employees reported being at least partially familiar with procedures for such crisis situations, approximately 22% indicated that they either lacked sufficient information or had not received proper training. This points to the need for more frequent and higher-quality training sessions to ensure that all employees are fully prepared to respond effectively in a crisis.

On a positive note, employees exhibited a high level of trust in the existing measures to mitigate bomb threats. More than 86% regarded these measures as appropriate. None of the respondents rated them as entirely insufficient, which indicates a well-structured security infrastructure and overall employee satisfaction with current procedures.

4. DISCUSSION

The results of the questionnaire survey conducted among passengers and airport employees revealed interesting findings that highlight both differences and similarities in their perceptions of safety, crisis preparedness, and overall attitudes toward security measures.

In terms of the sense of security, both groups (passengers and employees) generally perceive the airport as a relatively safe environment. Among passengers, 82% stated they feel “rather safe” or “very safe.” Among employees, this proportion was even higher, with 89% expressing a positive sense of safety at their workplace. This difference may stem from the fact that employees have more information about security procedures and are familiar with internal protection mechanisms, while passengers primarily assess security based on visible measures.

Similar differences emerged in the evaluation of security measures. While 75% of passengers considered the measures appropriate, this view was shared by 86% of employees. It can be assumed that employees have a more realistic understanding of the measures, their purpose, and their effectiveness.

A significant difference was observed in responses to a bomb threat scenario. Up to 82% of passengers said they would feel fear, stress, or nervousness, whereas among employees, only 47% reported such feelings, with some describing only mild tension. This difference is understandable passengers are mostly passive observers in such situations, whereas employees are trained to handle crises, allowing them to remain calmer and more confident in their abilities.

Regarding psychological strain, most passengers (31%) feel generally calm, but their stress levels increase sharply when imagining a bomb threat. Conversely, employees are exposed to longer-term, mild psychological stress, especially due to repeated false threats. More than half (58%) admitted that such threats affect their mental well-being, underscoring the need for increased psychological support and stress resilience measures.

There is also a gap in information and preparedness for crisis situations. While 78% of employees stated they are trained in procedures for bomb threats, only around 18% of passengers felt they had sufficient information about security measures. This indicates a need for better public awareness through visual materials, announcements, or digital communication at airports.

Interestingly, both groups agree on the need to improve airport security. Passengers suggested more frequent checks, increased presence of security personnel (e.g., police, sniffer dogs), and technological innovations such as cameras. Employees indicated that enhanced security measures would improve their sense of safety, with more than half stating it would have a significant positive effect.

Overall, airport employees perceive the security situation positively and most feel prepared to respond to potential threats. Nonetheless, there are still weaknesses in training, awareness, and psychological resilience that should be addressed by airport management. Improvements in these areas could significantly enhance satisfaction, confidence, and preparedness to handle unexpected events. In an environment where risks are not just hypothetical but real, consistent prevention and preparedness form the foundation of effective defence.

The comparison of both groups shows that passengers and employees generally have a positive attitude toward airport security, with employees showing greater confidence in system functionality and their own preparedness. Passengers, by contrast, are more prone to stress when faced with the idea of a threat, which is natural given their passive role.

4. CONCLUSION

The results of this study offer a comprehensive overview of airport security perceptions from two primary groups (passengers and employees). The analysis revealed that both groups generally feel safe and perceive existing security measures positively. However, their attitudes differ in certain areas, particularly concerning emotional responses to crisis situations, levels of preparedness, and awareness.

As external participants in the airport environment, passengers tend to respond more emotionally to potential threats such as bomb scares, with most indicating they would feel stress, fear, or nervousness. In contrast, employees demonstrated greater self-confidence and readiness, which correlates with their training and knowledge of internal procedures.

Another key finding is that false bomb threats negatively impact the mental well-being of employees, even in the absence of a genuine threat. The repeated occurrence of such incidents increases stress levels and can adversely affect workplace comfort and performance. The study also identified a lack of public awareness regarding appropriate behavior during crisis situations, which may hinder passengers' ability to respond rationally and cooperate effectively with airport staff.

The study has several limitations, including a relatively small sample size that does not allow for fully representative conclusions about the general population. The predominance of younger respondents—particularly those aged 18–25—may have influenced the results, as younger individuals might exhibit different attitudes compared to older ones. Additionally, data collection relied on a self-perception questionnaire method, which can be influenced by respondents' current mood, personal experiences, or interpretation of the questions.

Based on these findings, several practical recommendations emerge. Passengers should be informed about security procedures and crisis response protocols through visual announcements, leaflets, and digital displays at airports. Staff should undergo regular training and participate in drills simulating crisis scenarios, with a focus on incident management and improving internal communication [7]. Furthermore, airport personnel should be trained in psychological resilience and stress management. Professional support should be made available to employees following exposure to false or real threat situations. Finally, suggestions from both passengers and employees such as increasing surveillance cameras, expanding security checks, and enhancing spatial organization should be taken seriously. Where appropriate, basic information about security systems should be communicated to the public without compromising operational efficiency.

References

[1] Kirschenbaum, A. The social foundations of airport security. *Journal of Air Transport Management*, 2015, Vol. 48, p. 34–41. Available at: https://doi.org/10.1016/j.jairtraman.2015.06.010
[2] Dillon, T.W., Thomas, D.S. Exploring the acceptance of body searches, body scans and TSA trust. *Journal of Transportation Security*, 2015, Vol. 8, p. 51–67. Available at: https://doi.org/10.1007/s12198-015-0157-7
[3] Rizk, C., Mora-Camino, F., Batatia, H. Optimization of passengers screening operations in air terminals. *Transportation Research Procedia*, 2018, Vol. 35, p. 23–34. Available at: https://doi.org/10.1016/j.trpro.2018.12.004
[4] Akhtar, J., Bjornskau, T., Veisten, K. Assessing security measures reducing terrorist risk: inverse ex post cost-benefit and cost-effectiveness analyses of Norwegian airports and seaports. *Journal of Transportation Security*, 2010, Vol. 3, No. 3, p. 179–195.
[5] Klenka, M. Major incidents that shaped aviation security. *Journal of Transportation Security*, 2019, Vol. 12, No. 1–2, p. 39–56.

[6] Ernst-Vintila, A., Delouvée, S., Roland-Lévy, C. Under threat. Lay thinking about terrorism and the three-dimensional model of personal involvement: a social psychological analysis. *Journal of Risk Research*, 2011, Vol. 14, No. 3, p. 297–324.
[7] Uchronski, P. Responsibilities of airport management in a crisis situation - information flow. In: *11th International Conference on Transport Systems Telematics (TST 2011). Modern Transport Telematics*, 2011, Vol. 239, p. 299–305.
[8] Trachtman, J.P. Global Cyberterrorism, Jurisdiction, and International Organization. Tufts University – The Fletcher School of Law and Diplomacy, 2004. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=566361 [Accessed 23 May 2025].

Received 5, 2025, accepted 6, 2025