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A STUDY ON IMPACT OF AIRPORT SECURITY MEASURES ON PASSENGER'S SATISFACTION WITH REFERENCE TO CHENNAI AIRPORT

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Abstract

The execution of airport security is essential to provide the safety and security of travelers, airport staff, and aircraft. It is an essential procedure that is important for protecting air travel operations and to make sure that everyone is safe while travelling by air. However, passengers might feel uncomfortable while doing safety and security procedures, including body scans and lengthy baggage inspections. The current study examines the relationship between the level of satisfaction felt by travelers and the impact of security measures used at airports. It also examines the effects of various safety precautions on travelers as well as their perception of the need for such measures. The conclusions obtained from this study will provide helpful information into the ways in which individual data in airport environments this enables administrators to find a balance between ensuring safety and satisfying passengers.

Keywords: airport security, safety measures, passenger satisfaction, safety precautions.

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INTRODUCTION

Airport security measures include various kinds of actions designed to protect passengers, their belongings, and aircraft from hazards or injury. The majority of procedures used to maintain airport security involve thoroughly checking passengers and their luggage for prohibited belongings. Additional precautions include restricting access to specified areas, assigning qualified employees to maintain safety standards, using sophisticated monitoring systems, maintaining carefully to established protocols, and cooperating with law enforcement agencies. The goal is to prevent unauthorized entrance, identify potential threats, and ensure the health and safety of both the airport facility and people who utilize it for transportation.

In airport the security measures are same for everyone except higher government officials and VIPs. The types of airport security measures include luggage scanning, metal detector, and dispose of any objects such as liquids, gels and flammable materials, these measures are designed to prevent unauthorized access and detection of potential threats.

The airport security measures can affect the passenger's satisfaction level by long ques and waiting times at security checkpoints and security screenings, such as removing shoes, belts, and electronics from their bags. Passengers may feel uneasy and anxious as a result of disruptive security measures like pat-down checks or body scanners, which lowers passenger satisfaction.

OBJECTIVE

- To analyze various security measures in airport
- To identify how airport security measures affect passenger satisfaction.
- To observe the passenger's mentality during the security check at airport.

LIMITATIONS OF THE STUDY

1. The study was carried out only for Chennai airport.
2. Due to time constraint study was restricted to three months period of time.
3. Accessible to data in airport was restricted hence it is highly confidential.

REVIEW OF LITERATURE

The article's primary goal is to examine the connection between airport environments physically and passengers' perceptions of safety. The physical environment of airports, including elements like sanitary conditions, air quality, and social isolation policies, is also covered in this article as a potential influence on travelers' perceptions of safety during a pandemic. It may also draw attention to how travelers' intentions to travel domestically in China are influenced by their perceptions of safety. Additionally, the article may go into the function of passenger pleasure as a mediating factor in this connection, i.e., how passengers' perceptions of safety and travel intentions are influenced by how they feel about the physical environment of airports. Passenger satisfaction may be significantly impacted by security measures implemented at airports during the COVID-19 pandemic, according to the controlling function of passenger satisfaction**. Ma, Ding, and Ma (2022)[1]** The study focuses on how passenger satisfaction in American airports is affected by security measures. Airport security measures have an important impact on passenger satisfaction Due to increased screening processes and limitations on carry-on items, as well as other increased security measures, passengers frequently experience dissatisfaction and delays. Although these procedures are put in place to ensure the safety and security of air travel, they may also lead to a decline in customer

satisfaction. **Sakano, Obeng, and Fuller (2016)[2]** The study looks at how passenger behavior intentions and airport atmospheres are related, with a particular emphasis on the moderating effect of perceived safety. The study emphasizes that security measures are a crucial component of perceived airport safety and can have a big influence on customer satisfaction. The authors contend that the link between airport atmosphere, satisfaction, and behavioral intentions might be moderated by passengers' feelings of safety. **(Moon, Yoon, & Han, 2017)[3]** The study gives information on how safety measures affect passenger satisfaction. The author highlights the relevance of security measures in influencing passengers' perceptions and experiences as she explores several important research and concepts linked to airline service quality and customer happiness. According to the literature analysis, security measures including baggage screening, identification checks, and boarding procedures are essential for guaranteeing passenger safety and security, but they can also have an impact on customer satisfaction. It has been highlighted that excessive security measures, including as lengthy waiting times and intrusive screening processes, can cause passenger dissatisfaction and disappointment. On the other hand, good security measures can increase loyalty and passenger satisfaction. **Namukasa, J. (2013)[4]** the study emphasizing the significance of safety precautions in the aviation sector and their possible influence on customer satisfaction. They go over earlier studies that looked at the connection between security precautions and passenger views, taking into account things like waiting times, screening procedures, and inconvenience. The idea of "enplanement intentions," which refers to the possibility that passengers may decide to board an aircraft despite security precautions. **Alards-Tomalin et al. (2014)[5]** The authors examine prior studies that looked at how security measures, notably those established in response to the COVID-19 epidemic, have impacted the happiness of travelers at airports. Examining research on passengers' opinions of security measures like temperature checks, social distancing rules, and mask-wearing restrictions is one way to do this. The assessment of the literature also takes into account studies on how these security measures affect other facets of the passenger experience, including as wait times, crowding, and the general standard of airport services. **Lopez-Valpuesta, L., & Casas-Albala, D. (2023)[6]** The main goal of the paper is to investigate the idea of virtual queuing as a way to enhance the efficiency and effectiveness of airport security lanes. The possible advantages and difficulties of adopting virtual queuing at airport security lanes have been examined by the authors using empirical study, such as simulations or mathematical modelling. In order to assess how well virtual queuing reduces wait times, boosts passenger happiness, and optimises resource allocation, data analysis and modelling approaches have been applied. The study's conclusions provide clarification on the merits and disadvantages of virtual queuing as a means of improving the efficacy and efficiency of airport security lanes. **De Lange, R., Samoilovich, I., & Van Der Rhee, B. (2013)[7]** The article's primary objective is to look at how satisfied travelers are with airport security services. The authors want to know how passengers feel about the security services offered at airports, how satisfied they are with them, and what variables could affect that satisfaction. The results of the article may shed light on the elements that influence passengers' happiness or displeasure with airport security services and offer insights into how satisfied they are with those services overall. It could go through how customer satisfaction with airport security services affects administration of the airport, marketing plans, and the entire passenger experience. **Güreş, N.**, **Yılmaz, H.**, **Arslan, S.**, **Durmuşçelebi, C.**, **Yüksel,**

C., & **Ünsal, H. H. (2017)**[8] The article likely focuses on identifying and examining the factors that impact customer satisfaction with the quality of services at Da Nang International Airport in Vietnam. The article may include factual data and research findings about customer satisfaction, service quality, and variables affecting travelers' opinions of airport services. The article also demonstrates how customer satisfaction may be impacted by perceived wait times for several airport procedures, including check-in, security screening, immigration, and baggage claim. **Hai, P.T., Tam, V.V., & Thuong, M.T., (2017)**[9] The article focuses on analyzing, from a sustainable viewpoint, how passengers' emotional reactions and the airport's overall perception are affected by the length of time they must wait for airport security screening services. It is probable that the article elucidates the findings of an investigation into how airport screening wait times can affect passenger sentiment and assessment of the airport's image. **Kim, M. H., Park, J. W., & Choi, Y. J (2020)**[10] The article include the findings of a research project that looks at the variables that affect passengers' satisfaction with airport services. It looks at a range of factors affecting the quality of airport services, including amenities, staff behavior, security measures, wait times, information availability, and overall service experience. The study collect passenger data using quantitative or qualitative research methods, and it utilize statistical analysis to pinpoint the major factors that influence passenger happiness. **Bogicevic, V., Yang, W., Bilgihan, A., & Bujisic, M. (2013)**[11]

Research Methodology

The major objective of this research is to determine the differences in viewpoints between influencing variable customer satisfaction and satisfaction on security measures on Chennai airport. 97 passengers who are flew through Chennai airport were surveyed using a structured questionnaire in order to discover their relative preferences for each travel. Collected questionnaire was tested by using SPSS statistical tools. Following tests are carried out for the study

1. reliability analysis
2. Factor analysis
3. anova

Data Analysis and Interpretation

1 Reliability analysis for SSM

Reliability Analysis- SSM		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.691	.691	11

KMO and Bartlett's Test of Sphericity for all the 11 variables that influences the preference of SSM were performed for the items. The following table shows the result of the analysis.

2 Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity for Influence of Passenger Satisfaction

KMO and Bartlett's Test		SSM
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.721
Bartlett's Test of Sphericity	Approx. Chi-Square	300.826
	df	55
	Sig.	<.001

KMO Bartlett's Test for sphericity was performed and the measure was found to be 0.721 for SSM respectively which is above the obligatory minimum of 0.5. Hence confirming the sampling adequacy. This test was found to be significant at (P<0.01) with the Chi-square value of 300.826 for SSM respectively confirming the stability of the data set for factor analysis.

3 Descriptive Statistics of 11 variables and its Communalities

Factors	SSM Factors	Extraction
Inconvenience	Inconvenient aspect in SM	0.679
	Flight issued due to delays in SM	0.559
	SM process burdensome on passengers	0.518
Quality	Technological advancement in SM	0.631
	Necessity of SM to ensure passenger safety	0.649
Effectiveness	SM infringe on personal privacy	0.709
	SM effectiveness in preventing security threats	0.891
	Consistency of implementing SM	0.616
	Level of comfort during security screening process	0.583
Efficiency	Level of transparency in SM	0.771
	Convenience of security measures	0.662

All the 11 variables under the 4 factors had communalities greater than 0.5. Higher communalities indicate that larger amount of variance in the variables that has been extracted

by the factor solution. This indicates that all the 11 variables were considered for the study and no variable was eliminated.

4 Factor Loading for Key Variables of Satisfaction in Security Measures (SSM)

Key Attributes of SSM	Factor Loading		Initial Eigen Values		
			Total	% of Variance	Cumulative %
Inconvenient Aspect In SM	0.731	Inconvenience	3.171	28.828	28.828
Flight Missed Due To Delays in SM	0.688				
SM Process Burdensome On Passengers	0.713				
Technological Advancement In SM	-0.759	Quality	1.77	16.095	44.923
Necessity of SM To Ensure Passenger Safety	0.775				
SM Infringe On Personal Privacy	0.662	Effectiveness	1.293	11.757	56.68
SM Effectiveness In Preventing Security Threats	0.931				
Consistency Of Implementing SM	0.586				
Level Of Comfort During Security Screening Process	0.748				
Level Of Transparency In SM	0.875	Efficiency	1.032	9.386	66.065
Convenience Of Security Measures	0.812				

All 11 variables of SSM have significant factor loading under four factors. The factor loading must be greater than 0.5 and here the factor loading of SSM ranges from -0.759 (Consistency of Implementing SM) to 0.931 (SM Effectiveness in Preventing Security). Percentage of the total variance is explained by all the factors.

Factor 1 explained 28.828% of total variance. Principal component analysis of extraction method was employed with the varimax rotation method converged in four iterations.

In this study the regression analysis was used to derive an appropriate mathematical expression for finding values of dependent variable (Passenger Satisfaction) on the basis of the independent 11 variables (4 factors:

Convenience, Quality, Effectiveness, Efficiency). The modal summary for key metrics of SSM and passenger satisfaction. The model fit output consists of "Modal Summary" and "ANOVA".The modal summary includes multiple correlation coefficient R and R - Square and also the adjusted version of this coefficient has summary measures of the model fit. As per the table the linear regression coefficient R = 0.561 SSM and R Square = 0.315 for SSM indicating that 51.1% of variation respectively in the key metrics of SSM explained by 11 variables.

5. Analysis of Variance (ANOVA)

ANOVA is implemented to find the existence of significant variance between Level of Satisfaction on flexibility and Influencing variables on customer satisfaction

5.1.1 Model for key attributes of Satisfaction of Security Measures (SSM)

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.561[a]	.315	.235	.68432	1.550
a) Predictors: (Constant), SSM 11 FACTORS					
b) Dependent Variable: Satisfaction of SM in Chennai Airport					

Getting the confidence intervals at 95% the result of ANOVA test provides a F-test Value where F= 3.924 for with P<0.001 for SSM reflected significant relation with passenger satisfaction. This means that the prediction of passenger satisfaction by the 11 variables under SSM was found to be linear.

5.1.2 ANOVA for key attributes of Satisfaction of Security Measures (SSM)

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20.216	11	1.838	3.924	<.001[b]
	Residual	44.020	94	.468		
	Total	64.236	105			
a) Dependent Variable: Satisfaction of SM in Chennai Airport						
b) Predictors: (Constant), SSM 11 FACTORS						

The key metrics of 11 variables in viz., SSM necessity, SSM level of transparency of SM, SSM Convenience of SM, SSM level of comfort were all found to be significant at P<0.001. While SSM necessity (X3), level of transparency (X4), convenience of SM (X7), level of comfort (X9), SSM level of transparency (X4) had negative relationship with passenger satisfaction.

Y=1.399+0.224X3-0.275X4+0.257X7+0.244X9

5.2.1 Model for key attributes of Satisfaction of Security Measures (SSM)

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.494[a]	.244	.155	.65243	2.122
a) Predictors: (Constant), SSM 11 FACTORS					
b) Dependent Variable: Professionalism of security personnel					

Getting the confidence intervals at 95% the result of ANOVA test provide a F-test Value where F= 2.756 for with P<0.001 for SSM reflected significant relation with passenger satisfaction. This means that the prediction of passenger satisfaction by the 11 variables under SSM was found to be linear.

5.2.2ANOVA for key attributes of Satisfaction of Security Measures (SSM)

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.903	11	1.173	2.756	<.004[b]
	Residual	40.012	94	.426		
	Total	52.915	105			
a) Dependent Variable: SSM- Professionalism of security personnel						
b) Predictors: (Constant), SSM 11 FACTORS						

The key metrics of 11 variables in viz., SSM necessity, SSM level of comfort were all found to be significant at P<0.004[b]. While SSM necessity (X3), level of comfort (X9), both had positive relationship with passenger satisfaction.

Y=2.567+0.208X3+0.167X9

5.3.1 Model for key attributes of Satisfaction of Security Measures (SSM)

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.703[a]	.495	.435	.64998	2.022
a) Predictors: (Constant), SSM 11 FACTORS					
b) Dependent Variable: SM impact on efficiency of departure process					

Getting the confidence intervals at 95% the result of ANOVA test provides a F-test Value where F= 8.361 for with P<0.001[b] for SSM reflected significant relation with passenger satisfaction. This means that the prediction of passenger satisfaction by the 11 variables under SSM was found to be linear.

5.3.2ANOVA for key attributes of Satisfaction of Security Measures (SSM)

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	38.854	11	3.532	3.532	<.001[b]
	Residual	39.712	94	.422		
	Total	78.566	105			
a) Dependent Variable: SM impact on efficiency of departure process						
b) Predictors: (Constant), SSM 11 FACTORS						

The key metrics of 11 variables in viz., SM effectiveness, SSM Convenience of SM, SSM consistency were all found to be significant at P<0.001[b]. While SSM convenience (X7), SSM consistency (X8), SM effectiveness (X6) had negative relationship with passenger satisfaction.

Y=1.303-0.431X6+0.225X7+0.343X8

5.4.1 Model for key attributes of Satisfaction of Security Measures (SSM)

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.645[a]	.416	.347	.40592	1.921
a) Predictors: (Constant), SSM 11 FACTORS					
b) Dependent Variable: Unpleasant experience during SSP					

Getting the confidence intervals at 95% the result of ANOVA test provide a F-test Value where F= 6.075 for with P<0.001[b] for SSM reflected significant relation with passenger satisfaction. This means that the prediction of passenger satisfaction by the 11 variables under SSM was found to be linear.

5.4.2 ANOVA for key attributes of Satisfaction of Security Measures (SSM)

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.012	11	1.001	6.075	<.001[b]
	Residual	15.488	94	.165		
	Total	26.500	105			
a) Dependent Variable: Unpleasant experience during SSP						
b) Predictors: (Constant), SSM 11 FACTORS						

The key metrics of 11 variables in viz., Flight missed due to SM, SSM necessity, level of transparency, SM effectiveness, SM process burden, technological advancement in SM were all found to be significant at $P<0.001^b$. While Flight missed due to SM(X2), level of transparency(X4), SM effectiveness(X6), SM process burden(X10) and technological advancement(X11) had negative relationship with passenger satisfaction, SSM necessity (X3) had negative relationship with passenger satisfaction.

$$\mathbf{Y=0.652+0.254X2-0.169X3+0.101X4+0.196X6+0.259X10-0.216X11}$$

CONCLUSION

The research problem of the paper was to examine the relationship between influencing passenger satisfaction and satisfaction in security measures. The study found that passengers may feel uneasy and anxious due to disruptive security measures like by long ques and waiting times at security checkpoints and security screenings, such as removing shoes, belts, and electronics from their bags, which can lower passenger satisfaction. The study also found that passengers perceive the need for security measures, but they want them to be less intrusive and more efficient.

The study was conducted at Chennai airport, India, and was limited to a three-month period due to time constraints. The researchers collected data from 97 passengers who had traveled through the airport during the study period. The data was collected using a questionnaire that was designed to measure passenger satisfaction levels and their perception of airport security measures.

The study found that passengers who had to undergo more intrusive security measures, such as pat-down checks or body scanners, reported lower levels of satisfaction with the security process. Passengers also reported feeling anxious and uneasy during the security process, which negatively impacted their overall travel experience. However, passengers also recognized the need for security measures and believed that they were necessary to ensure their safety while traveling.

The study highlights the need for airport administrators to find a balance between ensuring safety and satisfying passengers. The researchers suggest that airport administrators should consider implementing security measures that are less intrusive and more efficient. For example, using advanced technology like biometric scanners or facial recognition software could help reduce the need for pat-down checks or body scanners. Additionally, providing clear and concise instructions to passengers about the

security process could help reduce anxiety and improve passenger satisfaction levels.

In conclusion, the study suggests that airport security measures can have an impact on passenger satisfaction levels. Passengers want to feel safe while traveling, but they also want to have a positive experience at the airport. Therefore, airport administrators need to consider the impact of security measures on passenger satisfaction and find ways to make the security process less intrusive and more efficient.

Findings

- The findings of the paper results show that there is a strong association between the security measures implemented at airports and passenger's satisfaction ratings at Chennai International Airport.
- There is need for improvement in several areas, such as the speed of inspection processes and the conduct of security officers. This conclusion is made in light of research showing that customers are typically satisfied with the security measures implemented at this airport.
- The research emphasized these factors as contributing factors: the efficiency of security checks, the behavior of security personnel, and the availability of information about security procedures. The findings of this study can be used to improve security operations at airports across the world, including Chennai International Airport.

Bibliography:

Reference:

1 Ma, G., Ding, Y., & Ma, J. (2022). The impact of airport physical environment on perceived safety and domestic travel intention of Chinese passengers during the COVID-19 pandemic: The mediating role of passenger satisfaction. *Sustainability*, *14*(9), 5628. https://doi.org/10.3390/su14095628

2 Sakano, R., Obeng, K., & Fuller, K. (2016). Airport security and screening satisfaction: A case study of US. *Journal of Air Transport Management*, *55*, 129–138. https://doi.org/10.1016/j.jairtraman.2016.05.007

3 Moon, H., Yoon, H. J., & Han, H. (2017). The effect of airport atmospherics on satisfaction and behavioral intentions: Testing the moderating role of perceived safety. *Journal of Travel and Tourism Marketing*, *34*(6), 749–763. https://doi.org/10.1080/10548408.2016.1223779

4 Namukasa, J. (2013). The influence of airline service quality on passenger satisfaction and loyalty: The case of Uganda airline industry. *TQM Journal*, *25*(5), 520–532. https://doi.org/10.1108/TQM-11-2012-0092

5 Alards-Tomalin, D., Ansons, T. L., Reich, T. C., Sakamoto, Y., Davie, R., Leboe-McGowan, J. P., & Leboe-McGowan, L. C. (2014). Airport security measures and their influence on enplanement intentions: Responses from leisure travelers attending a Canadian University. *Journal of Air Transport Management*, *37*, 60–68. https://doi.org/10.1016/j.jairtraman.2014.02.004

6 Lopez-Valpuesta, L., & Casas-Albala, D. (2023). Has passenger satisfaction at airports changed with the onset of COVID-19? The case of Seville airport (Spain). *Journal of Air Transport Management*, 108, 102361. https://doi.org/10.1016/j.jairtraman.2023.102361

7 De Lange, R., Samoilovich, I., & Van Der Rhee, B. (2013). Virtual queuing at airport security lanes. *European Journal of Operational Research*, *225*(1), 153–165. https://doi.org/10.1016/j.ejor.2012.09.025

8 Güreş, N., Yılmaz, H., Arslan, S., Durmuşçelebi, C., Yüksel, C., & Ünsal, H. H. (2017). Researching the satisfaction levels of passengers for security services at airports. *International Journal of Marketing Studies*, *9*(5). https://doi.org/10.5539/ijms.v9n5p125

9 Thanh Hai, P., Duc Toan, L., Viet Tam, V., & Thi Thuong, M. (2017). Factors affecting customer satisfaction with the quality of services: Empirical evidence at Da Nang International Airport, Vietnam. *Asian Journal of Empirical Research*, *7*(3), 61–74. https://doi.org/10.18488/journal.1007/2017.7.3/1007.3.61.74

10 Kim, M. H., Park, J. W., & Choi, Y. J. (2020). A study on the effects of waiting time for airport security screening service on passengers' emotional responses and airport image. *Sustainability*, *12*(24), 10634. https://doi.org/10.3390/su122410634

11 Bogicevic, V., Yang, W., Bilgihan, A., & Bujisic, M. (2013). Airport service quality drivers of passenger satisfaction. *Tourism Review*, *68*(4), 3–18. https://doi.org/10.1108/TR-09-2013-0047