THE EFFECT OF PASSENGER UNDERSTANDING OF THE BODY SCANNER INSPECTION PROCEDURE ON THE SMOOTH INSPECTION AT THE PASSENGER SECURITY CHECK POINT AT DJALALUDDIN GORONTALO AIRPORT

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Abstract

This study aims to analyze the influence of passenger understanding of Body Scanner procedures on the inspection process efficiency at PSCP Djalaluddin Airport Gorontalo. Using a quantitative method and questionnaires, the results show a correlation coefficient of 0.925 and an R Square of 0.855, indicating a very strong influence of passenger understanding on the smoothness of the security screening process. These findings highlight the importance of educating passengers to enhance security screening effectiveness.

Keywords: Body scanner, passenger understanding, smooth check, security check, Passenger Security Check Point (PSCP)

1. INTRODUCTION

Indonesia, as the largest archipelagic country in the world, makes air transportation a vital link between regions [1]. Airports have an important role to play in supporting mobility, trade, tourism, and economic growth. One of them is Djalaluddin Gorontalo Airport (ICAO: WAMG, IATA: GTO), which was formerly known as Tolotio Airport. This airport serves as the main gateway to air transportation in Gorontalo and is named in honor of Lt. Col. Pnb. Djalaluddin Tantu [2].

Aviation security is regulated in Law Number 1 of 2009, which emphasizes the need for synergy between integrated human resources, facilities, and procedures [3]. As technology develops, security challenges also increase due to the potential misuse of technology by irresponsible individuals. Therefore, the role of the officer Aviation Security (AVSEC) in Passenger Security Check Point (PSCP) is very important to ensure that the inspection runs effectively and efficiently.

Djalaluddin Airport has two checkpoints, namely the Hold Baggage Security Check Point (HBSCP) for baggage and PSCP for cabin luggage. According to Government Decree Number 138 of 2018, security facilities must have metal and non-metal detection devices such as X-rays and Body Scanners. The use of Body Scanners helps AVSEC detect passengers' luggage hidden in the body, while reducing human error. However, its implementation still faces challenges due to the lack of passenger understanding of its usage procedures, resulting in frequent queues and re-checks.

Based on observations during On the Job Training (OJT), use Body Scanner at Djalaluddin Airport is a strategic effort to improve safety standards in accordance with the Decree of the Director General of Civil Aviation Number 2765 of 2010 [4]. However, the passenger's low understanding of the inspection procedure is an obstacle in the smooth process. Therefore, the researcher intends to raise this theme in the discussion of the Final Project entitled "The Influence of Passengers' Understanding of the Inspection

Procedure Body Scanner On the smooth inspection of the Passenger Security Check Point At Djalaluddin Gorontalo Airport".

2. METHOD

This study uses a quantitative approach method that is confirmative to test the hypothesis statistically [5]. This approach is based on philosophy positivism with random sampling and data collection through questionnaire instruments, which were analyzed quantitatively using descriptive statistics. This method was chosen to measure the influence of passengers' understanding of the screening procedure Body Scanner on the smooth inspection in Passenger Security Check Point (PSCP) Djalaluddin Gorontalo Airport.

2.1 RESEARCH DESIGN

Research design is a systematic stage that includes data collection and analysis to determine the variables that are the focus of the research. This design plays an important role in compiling an organized framework so that each element of the research is logically and systematically connected, so that the process of analysis and selection of subjects can be carried out effectively and efficiently in accordance with the research objectives.

This study focuses on passengers' understanding of the procedure for using the Body Scanner for the smooth inspection at the Passenger Security Check Point (PSCP) of Djalaluddin Gorontalo Airport. The design of this study includes steps to explore the relationship between passenger understanding, behavior during examination, and its impact on the smooth process at PSCP, so that it can be a guideline for the implementation of structured and targeted research.

2.2 RESEARCH VARIABLES

A research variable is an attribute, trait, or value of a person, object, or activity that has a certain variation and is determined by the researcher to be studied and conclusions drawn [6]. This study uses two variables, namely the independent variable (X) in the form of the Passenger's Level of Understanding of the Inspection Procedure Body Scanner, and the bound variable (Y) in the form of Smooth Inspection in Passenger Security Check Point (PSCP).

2.3 POPULATION, SAMPLE AND OBJECT OF RESEARCH

Population is a generalized area consisting of objects or subjects that have certain characteristics to be studied [7]. The population in this study is passengers who use air transportation services at Djalaluddin Gorontalo Airport, with a total population of 469 passengers.

Samples are part of the population that are used as a source of research data [8]. This study uses the purposive sampling, that is, the determination of the sample with certain considerations. The sample in this study amounted to 40 respondents, with the criteria of passengers who were at least 17 years old and departed at Djalaluddin Gorontalo Airport.

The research conducted by the researcher is using the formula Taro Yamane [9] that is:

$$n = \frac{N}{N.d^2 + 1}$$

Information:

n: Number of samples

N: Total population

d: Precision set

Using this formula, the number of samples (n) in this study can be calculated

using *the Taro Yamane formula* with a precision value of 15% (0.15):

$$n = \frac{N}{N.d^2+1}$$

$$= \frac{469}{469\ x\ (0{,}15)^2+1}$$

$$= \frac{469}{11{,}55}$$

$$= 40.6$$

$$\approx 40$$

Based on the results of the calculation, it can be concluded that the sample from the research conducted was 40 passenger respondents departing at Djalaluddin Gorontalo Airport.

The object of research is the focus of the study to gain a deep understanding. The object of this study is passengers' understanding of the procedure for using Body Scanners for the smooth examination at the Passenger Security Check Point (PSCP) at Djalaluddin Gorontalo Airport.

2.4 DATA COLLECTION TECHNIQUES AND RESEARCH INSTRUMENTS

Data collection techniques are a strategic step in research because the data obtained is the main purpose of the research. Through this method, researchers can collect data related to the influence of passengers' understanding of the Body Scanner examination procedure on the smooth examination at Djalaluddin Gorontalo Airport.

2.4.1 Observation

The data collection technique through observation is carried out by directly observing symptoms or events in the research object to obtain data and information related to the activities being studied. This observation aims to observe the passenger's understanding of the Body Scanner examination procedure on the smooth examination at PSCP Djalaluddin Gorontalo Airport.

2.4.2 Literature Studies

Literature studies are a method of collecting data through searching for information from relevant literature, books, regulations, and research reports. In this study, a literature study was carried out by tracing the applicable regulations and the opinions of experts as a reference in solving research problems.

2.4.3 Questionnaire

Data collection in this study uses a closed questionnaire, which is a questionnaire with a choice of answers that have been provided so that respondents only choose the appropriate answers [10]. The statements in the questionnaire aim to obtain data related to the knowledge of the object being studied, which is then processed using the Likert scale. The questionnaire will be distributed via the link Google Form to passengers over 17 years old who will travel by air at Djalaluddin Gorontalo Airport.

2.4.4 Research Instruments

Research instruments are tools to measure phenomena [6]. This study used a closed questionnaire with a Likert scale to assess the effect of passengers' understanding of the Body Scanner procedure on the smooth examination at PSCP Djalaluddin Gorontalo Airport. The data was analyzed with SPSS.

2.5 DATA ANALYSIS TECHNIQUES

Data analysis is the process of organizing, compiling, and concluding data so that it is easy to understand (Sugiyono, 2019). The instrument test in this study was carried out to test the validity and reliability to ensure the accuracy of the instrument.

2.5.1 Validity and Reliability

Validity and reliability tests ensure that research instruments are accurate and

consistent. Validity measures the accuracy of the instrument in measuring variables, while reliability assesses the consistency of respondents' answers. The validity test is carried out by Pearson Product Moment and reliability tests using Cronbach's Alpha through SPSS.

Table 2. 1 Reliability Level

Alpha Cronbach	**Reliability Level**
0,00 – 0,20	Less Reliable
0,201 – 0,40	Somewhat Reliable
0,401 – 0,60	Quite Reliable
0,601 – 0,80	Reliable
0,801 – 1,00	Highly Reliable

2.5.2 Normality Test

The normality test aims to determine whether the data follows a normal distribution, which is a requirement for the classical assumption test. This study uses a Kolmogorov-Smirnov through SPSS version 25. The data is considered normal if the significance value (p-value) > 0.05, and vice more so if the < 0.05 [11].

2.5.3 Correlation Test

This study uses the Correlation Test *Rank Spearman* to know and measure the strength of the relationship between two variables. The value of the correlation coefficient is obtained through SPSS and interpreted as its strength level according to the set category [12].

Table 2. 2 Correlation Coefficients

Coefficient	**Category**
CP = 0.00	No Relationship/Correlation
0 < ≤ 0.20	Very weak relationship/correlation
0.20 < KK ≤ 0.40	Low/Weak Relationship/Correlation
0.40 < KK ≤ 0.70	Meaningful Relationship/Correlation
0.70 < KK ≤ 0.90	High Relationship/Correlation
0.90 < KK < 1.00	Very strong correlation
CD = 1	Perfect correlation

2.5.4 Uji Chi – Square

The Chi-Square test is a statistical method for analyzing nominal-scale categorical data, with the aim of knowing whether there is a relationship (association) between two variables [13]. This test is used to test the relationship or influence between categorical variables.

2.5.5 Simple Linear Regression Test

Simple linear regression is a statistical analysis technique to examine the cause-and-effect relationship between two variables, where an independent variable influences a dependent variable [14]. This analysis aims to find out how much influence independent variables have on dependent variables. This study used simple linear regression analysis to determine the influence of passengers' understanding of the procedure *Body Scanner* (X) on the smooth running of the inspection (Y) at PSCP

$$\mathbf{Y = a + b\ X}$$

Information:

Y = Dependent variable

a = Is the value of the variable Y when the variable X = 0

b = The magnitude of the change in variable Y resulting from the change in the value of variable X

X = Actual data value (Independent variable)

The basis for decision-making in regression analysis is seen from the significance value (Sig.):

1. If the Sig. < 0.05, it means that there is an effect of Passenger Understanding (X) on the Smooth Examination (Y).
2. If the Sig. > 0.05, it means that there is no significant influence of X on Y.

2.6 PLACE AND TIME OF THE RESEARCH

The research of this final project is located at Djalaluddin Gorontalo Airport which was

chosen because it coincides with the implementation of the researcher's On the Job Training (OJT), thus facilitating the process of data collection and direct observation in the field. The implementation of the research began at the same time as OJT activities from January 6 to February 28, 2025, which was the initial stage of observation, interviews, and data documentation. After that, the research will continue until June 2025 for the analysis stage, preparation of reports, and the completion of the entire series of activities according to the schedule that has been prepared, so that the research can run in a structured manner and in accordance with the set plan.

3. RESULTS AND DISCUSSION

The validity test was carried out by analyzing the correlation between the score of each indicator and the overall score of each variable using SPSS software. This study uses the formula Df = N – 2, 40 – 2 = 38.

Table 3. 1 Var X Validity Test Results

Instruments	Score	r_{tabel} 5%(38)	Information
X1	0,833	0,31201	Valid
X2	0,861	0,31201	Valid
X3	0,789	0,31201	Valid
X4	0,815	0,31201	Valid
X5	0,770	0,31201	Valid
X6	0,725	0,31201	Valid

Based on Table 3.1, all statement items on variable X have a calculated r-value greater than the r-table (0.31201) at a significance level of 5%, so that all instruments are declared valid and feasible to be used to measure the variable.

Table 3. 2 Var Y Validity Test Results

Instruments	Score	r_{tabel} 5%(38)	Information
Y1	0,727	0,31201	Valid
Y2	0,875	0,31201	Valid
Y3	0,820	0,31201	Valid
Y4	0,779	0,31201	Valid
Y5	0,809	0,31201	Valid
Y6	0,657	0,31201	Valid

Based on Table 3.2, all statement items on variable Y have a calculated r value greater than r of the table (0.31201) at a significance level of 5%, so that all instruments are declared valid and can be used to measure the variable.

Reliability Statistics

Cronbach's Alpha	N of Items
.874	6

Reliability Statistics

Cronbach's Alpha	N of Items
.870	6

Figure 3. 1 Var X and Y Reliability Test Results

Based on Figure 3.1, *Cronbach's Alpha* value of variable X is 0.874 and variable Y is 0.870, both of which exceed the minimum limit of 0.60, so that the instrument is declared reliable to measure each variable.

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		40
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	1.12424256
Most Extreme Differences	Absolute	.119
	Positive	.109
	Negative	-.119
Test Statistic		.119
Asymp. Sig. (2-tailed)		.163[c]

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.

Figure 3. 2 Normality Test Results

Based on the results of the normality test using the Kolmogorov-Smirnov method, a significance value of 0.163 was obtained, which was greater than the threshold of 0.05. This shows that the residual data in this study is distributed normally, thus meeting one of the important assumptions in statistical analysis.

Correlations

		PEMAHAMAN PENUMPANG	KELANCARAN PEMERIKSAAN
PEMAHAMAN PENUMPANG	Pearson Correlation	1	.925**
	Sig. (2-tailed)		.000
	N	40	40
KELANCARAN PEMERIKSAAN	Pearson Correlation	.925**	1
	Sig. (2-tailed)	.000	
	N	40	40

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 3. 3 Correlation Test Results

Based on Figure 3.3, the *Pearson Correlation value* of 0.925 with a significance of 0.000 (< 0.05) shows a significant relationship between passenger understanding and the smoothness of the examination. The correlation coefficient is included in the "Very Strong" category, so it can be concluded that the higher the passenger's understanding, the smoother the inspection process.

The results of the Chi-Square test were used to determine the significant relationship between the age and experience of passengers and the smooth examination at *the Passenger Security Check Point* (PSCP).

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	15.000[a]	1	.000		
Continuity Correction[b]	12.604	1	.000		
Likelihood Ratio	16.403	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	14.625	1	.000		
N of Valid Cases	40				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 8.00.
b. Computed only for a 2x2 table

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	26.667[a]	1	.000		
Continuity Correction[b]	23.438	1	.000		
Likelihood Ratio	33.825	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	26.000	1	.000		
N of Valid Cases	40				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 8.00.
b. Computed only for a 2x2 table

Figure 3. 4 Chi-Square Test Results

Since the significance value is less than 0.05, it can be concluded that there is a significant relationship between age and passengers' experience of the smooth inspection process.

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	.674	1.510		.447	.658
	PEMAHAMAN PENUMPANG	.862	.058	.925	14.980	.000

Figure 3. 5 Simple Linear Regression Test Results

From these results, it can be interpreted:

- Constant a is 0.674, this number is a constant number which means that if there is no Passenger Understanding, then the Smooth Inspection value is 0.674.
- Constant b is the number of regression coefficients. The value is 0.862, which means that for every 1 addition of the Passenger Comprehension value, the Smooth Examination value will increase by 0.862.
- This result shows that the variable "Passenger Comprehension" has a positive effect on the variable "Smooth Examination" of 0.862.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.925[a]	.855	.851	1.139

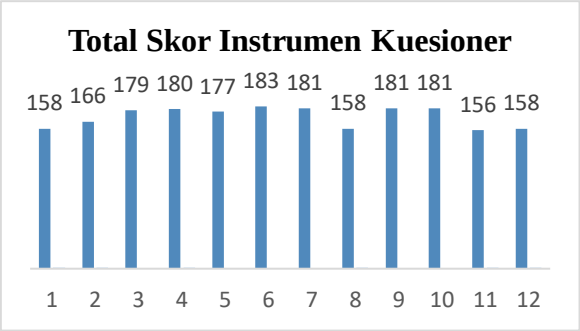
a. Predictors: (Constant), PEMAHAMAN PENUMPANG
b. Dependent Variable: KELANCARAN PEMERIKSAAN

Figure 3. 6 *Model Summary*

From these outputs, *a* determination coefficient (R Square) of 0.855 was obtained. It can be concluded that the effect of passenger understanding (Variable X) on the smooth running of the inspection (Variable Y) is 85.5%.

Passenger's Level of Understanding of Body Scanner Examination Procedures

Based on a questionnaire containing 12 statements distributed to 40 passengers at Djalaluddin Gorontalo Airport, the results of the analysis showed that passengers' understanding of the body scanner inspection procedure had a significant and positive effect on the smooth inspection at the Passenger Security Check Point (PSCP), where the better the passenger's understanding, the smoother the security inspection process.



According to the results of the questionnaire distribution, it was found that the statement that received the lowest score was statement number 11 "Information about *the Body Scanner* examination procedure is sufficiently available in the examination area.". Statements number 1, 8, and 12 also have a relatively low total score.

No.	Total Respondent Index
1	79%
2	83%
3	89,5%
4	90%
5	88,5%
6	91,5%
7	90,5%
8	79%
9	90,5%
10	90,5%
11	78%
12	79%
Average	**81%**

The results of the calculation of the average percentage index from the results of the questionnaire distribution were obtained that an average of 81% of passengers understood the body scanner examination procedure and 19% of passengers still did not understand the procedure. It can be concluded that passengers' understanding of the body scanner inspection procedure at Djalaluddin Gorontalo Airport is quite good, but it is necessary to improve passengers who still do not understand the procedure.

Factors that hinder the smooth examination using *a body scanner*

The results of the Chi-Square test showed a significance value of 0.000 < 0.05, which means that there is a significant relationship between the age and experience of passengers and the smooth examination in the PSCP area. Certain age factors and lack of experience, especially for passengers who are using air transportation for the first time, tend to cause confusion or procedural errors in the use of *body scanners*, thus slowing down the examination process and potentially causing long queues.

4. CONCLUSION

Based on a simple linear regression test, the correlation coefficient value (R) of 0.925 indicates a very strong relationship between passenger understanding and the smoothness of the examination in the *body scanner area*, with a determination coefficient (R Square) of 0.855 which means that 85.5% of the smoothness of the examination is explained by the level of passenger understanding. The average percentage of passenger understanding of 81% is relatively good, with the highest score in statement number 6 about the accuracy of the body scanner compared to WTMD. However, there are still 19% of passengers who do not understand the procedure well, as can be seen from the low scores in statements number 1, 8, 11, and 12 regarding the availability of procedural information in the examination area and the general understanding of *the body scanner*.

The results of the Chi-square test show the value of Asymp. Sig 0.000 (< 0.05), which means that there is a significant relationship between the age and experience of passengers and the smoothness of the check using *the body scanner* at *the Passenger Security Check Point* (PSCP). Thus, both factors can affect

the smooth running of the examination process.

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