

The Effect of Passenger Knowledge on Flight Safety

Nabila Maharani^{1*}, Muhammad Rifky Cahya Saputra², Reni Dian Octaviani³,
Arief Hernawan⁴, Rohana Sitanggang⁵

^{1,2,3,4,5} Institut Transportasi dan Logistik Trisakti, Jakarta, Indonesia

*Corresponding author: akbardanar@gmail.com

Abstract: This paper examines the effect of passenger knowledge in limiting liquid objects, namely Drinking Water to cabin baggage. Based on security factors issued by ICAO, liquid in the form of liquid, aerosol, gel (LAG) has its own limitations and rules. Security recommendations issued by ICAO to be aware of acts of terrorism that often use liquid objects as a medium / media in carrying out acts of terror. Therefore to bring it to the cabin, Drinking Water or liquid has a capacity limit requirement that all aircraft passengers must obey from the current risk of aviation safety. The passenger survey was conducted. The purpose of this study is to find out how much the level of knowledge of passengers about the capacity limit in carrying Mineral Water. Because there are still few passengers who are aware of the regulations regarding restrictions on Mineral Water in Aircraft Cabin. We recommend flight safety seminars in passenger knowledge about aircraft cabin baggage regulations. This study was analyzed using semi-quantitative methods that focus only on Liquid in Mineral Water or liquid body capacity limits that affect flight safety.

Keywords : passenger knowledge, liquid, cabin safety, LAG

1. Introduction

Commercial airline safety has improved dramatically since the industry's birth over a century ago (*Oster, Strong, & Zorn, 2013*). It's due to the safety is number one for passengers. Since long time ago, the risk has been taken as the most important index to evaluate the aviation safety. Aviation safety education is generally available to airline passengers before and during their flights, but not to all members of the general public, however, compared to other mass transportation, fire education, and safety education in public places. Although there are fewer aviation accidents than accidents in other transportation fields, the severity of aircraft accidents is usually much greater. However, when aviation accidents occur, passengers still have a good chance to survive. A study by The National Transportation Safety Board (NTSB) showed a 47% survival rate of passengers in aircraft accidents (NTSB, 2006). That is, the aviation safety is a state that the consequences caused by aviation action could be accepted by people (Mcintyre, 2000). These consequences include casualties, property loss and environment pollution, etc. Thus, the aviation safety risk can be represented as a function of scenarios of aviation action serious consequences and their possibilities (Ferdous et al. 2013) That is why all airlines apply some rules related to flight safety. When flying, carrying luggage to the cabin is a common thing to do. Every airline has its own rules regarding baggage that can be brought to the cabin. In addition to baggage size rules, there are also rules for objects that are prohibited from entering the trunk for reasons of flight safety. One of them is the limitation of liquid objects to cabin baggage for domestic and international flights. relating to cabin safety risks and risk factors categorized using the "5-M model" (media, man, machine, management, mission). This provides a framework for analyzing systems and determining relationships between the elements that work together to achieve a goal (US Federal Aviation Administration, 2000) All objects that are prohibited from entering cabin baggage are regulated by ICAO (International Civil Aviation Organization). Security recommendations issued by ICAO to be aware of acts of terrorism that often use liquid objects as a medium / media in carrying out acts of terror. All

forms of liquids, aerosols and gels (LAG) are included in the Dangerous Goods category. The danger caused will result in safety. In Indonesia, the limits of liquid substances are regulated by the Director General of Air Transportation Decree No. SKEP / 43 / III / 2007 concerning liquids, aerosols and gels, passengers are taken to the commercial aircraft cabin. Articles 2a and 3 (1) state that the three liquid objects stored in containers permitted in aircraft cabins are limited to a maximum of 100 millimeters. Meanwhile, liquids stored in containers purchased or originating from duty-free stores at the airport can be carried on board as long as 1,000 ml and must be closed again. In the United States (US), the Transportation Security Administration (TSA) applies the 3-1-1 rule since 2006 to all aircraft passengers. Based on the International Air Transport Association (IATA) in the Dangerous Goods Regulation and Annex 18 book on The Safe Transport of Dangerous Goods by Air, that Dangerous Goods are defined as substances or substances that have the potential to significantly harm health, safety or property when transported by airplane. Based on the ICAO (International Civil Aviation Organization) letter number 8 / 11-06 / 100 concerning the Recommended Security Control Guidelines for Screening Liquids, Aerosols and Gels for each member country of ICAO dated December 1, 2006. Where this letter recommends for every passenger on international flights can only carry luggage into the cabin (cabin baggage) which has basic materials derived from Liquid, Aerosol and Gels maximum 100 ml per package. liquid, aerosol and gels referred to in the Director General of Civil Aviation Regulation Number: SKEP / 43 / III / 2007 dated March 6, 2007 which can be in the form of: Beverages, Cosmetic equipment, Medicines, Daily necessities and others. Based on Director General of Air Transportation Regulation Number: SKEP / 2765 / XII / 2010 concerning Procedures for Security Check of Passengers, Aircraft Personnel and Default Goods Transported by Aircraft . Article 2 paragraph (1) of every passenger, aircraft personnel and Individuals entering a limited security area must have a valid entry permit, paragraph (2) every passenger, aircraft personnel and individual as referred to in paragraph (1) and luggage must be subjected to a security check. Based on Law No. 1 of 2009 concerning Aviation Security is a condition that provides protection to airlines from unlawful actions. Through the integration of the use of human resources, facilities, and procedures. In Article 37 the Chicago Convention states that; Each contracting State Undertakes to collaborate with the highest practicable degree of uniformity in regulation, standards, procedures, and organization in relation to aircraft, personnel, airways and auxiliary services will facilitate and improve navigation. In 2006 a group of terrorists planned to blow up planes in England. The explosive device is a liquid bomb.. As a result, the incident killed passengers and caused a large hole in the body of the aircraft," Hersem explained. The maximum volume of 3.4 ounces or 90 milliliters is determined not without calculation. According to the TSA, that number is the critical number where a liquid cannot possibly cause a large explosion. There is a trick if you want water in a drinking bottle to pass a security checkpoint. Freeze it. TSA allows frozen fluids to pass through the checkpoint, but the conditions must be completely frozen (solid). If it's soft or half melted, you will be asked to throw it away. Alternatively, bring an empty drinking water bottle. You can fill it in the filling point after passing the check point. The Research Aims to find the effect of passenger knowledge on flight safety.

Regulation for aviation safety

- LAG items which include drinks, creams, perfumes, sprays, gels and toothpastes, which must remain in their containers may be taken to cabin baggage with a maximum capacity of 100 ml or 100 mg
- If you carry a liquid that has a bottle size of more than 100 ml, it will still be held even if the contents stay a little because the limit of the size of the bottle is also 100 ml
- For all LAG container goods brought to the cabin, it must be placed in a transparent plastic bag that can be opened and closed

- Each passenger may only carry one of these transparent plastic bags with the total volume of liquid being carried cannot be more than 1 liter and the dimensions must not be greater than 20 cm x 20 cm.

Regulations for carrying LAG on all international flights in Indonesia are governed by ICAO Letter Number: US 8/11-06 / 10 concerning the Recommended Security Control Guidelines for Screening LAGs. On March 6, 2007, the Government of Indonesia through the Directorate General of Air Transportation issued SKEP / 43 / III / 2007 concerning Handling of Aerosol and Gel Liquids (Liquids, Aerosol and Gels) carried by passengers into aircraft cabin on international flights as national regulations.

Regulation on Liquid, Aerosol and Gels

International airplane passengers can carry liquid, aerosols and gels into the aircraft cabin as luggage for their own purposes. liquid, aerosol and gels referred to in the Director General of Civil Aviation Regulation Number: SKEP / 43 / III / 2007 dated March 6, 2007 which can be in the form of:

- 1. Drinks
- 2. Cosmetic equipment
- 3. Medicines

The procedure for carrying Liquid, Aerosol and Gels as passenger luggage at each passenger terminal, all international airports have a concessionaire in the form of duty free shop which acts as a seller of food, drinks, souvenirs etc. Based on observations in the field it is not uncommon that these items are in the form of Liquid, Aerosol and Gels. For example, not a few foreign nationals as passengers on airplanes on international flights who buy Alcohol (liquor) with packaging more than 100 ml. For this reason, every airport organizer based on SKEP / 43 / III / 2007 can regulate all international airplane passengers to be able to bring Liquid, Aerosol and Gels as daily necessities. The procedures imposed by International Airport organizers so that passengers can bring Liquid, Aerosol and Gels that they carry as daily necessities as cabin baggage are as follows:

1. Can show proof of purchase (struck purchase). This is so that the airport organizers through the Aviation Security division can ensure that the goods in the form of Liquid, Aerosol and Gels that have been purchased by passengers actually originate from the terminal that has been checked for safety before entering the international passenger terminal and not purchased from outside the terminal international passengers.
2. Transparent plastic bag measuring 30 cm x 40 cm. Every item in the form of Liquid, Aerosol and Gels must be included in a transparent plastic bag that indicates the items have been inspected and can be transported into the aircraft cabin, this transparent plastic bag is provided by the airport organizer.
3. The packaging seal is still good. Goods in the form of Liquid, Aerosol and Gels must be ensured that the seal on the package is still in good condition and not damaged. This is to ensure that Liquid, Aerosol and Gels carried in their original form are not in the form of other components that could endanger flight safety and security.
4. Deposited to cabin crew (Special Alcohol). This is so that a passenger carrying alcoholic drinks in the form of Liquid does not drink too much of the drink which is feared to cause the passenger to lose consciousness in the cabin so that it can threaten the conditions of flight safety and security.

With this SKEP / 43 / III / 2007 socialization, the hope is that there will be no repeated ironic events in which there are Indonesian citizens who are not aware of the SKEP / 43 / III / 2007 rules so they feel burdened by the limitation rules for carrying daily necessities. in the

form of Liquid, Aerosol and Gels that passengers will carry in the cabin of the aircraft (cabin baggage).

2. Methods

This study used correlational research with a quantitative approach that describes a general approach to research that focuses on assessing the variability among variables that appear naturally. Correlational research involves collecting data to determine whether, and to what degree, there is a relationship between two or more quantifiable variables. This research method used a sample of 50 correspondents. Statistical techniques used are descriptive statistics and inferential statistics. (Kiswoyowati, 2011)

A study can be started with a survey, then purposive sampling is carried out based on a survey (Brown 2005) Purposive sampling can be used with a number of techniques in data collection (Godambe 1982). Robbins et al. (1969) used questionnaires as a systematic way to find information in the study of acculturation. The researchers asked respondents what would show acculturation and carry out their responses through data reduction techniques to determine what qualities acculturated people. (Tongco, 2007)

Purposive stratification samples can also be used, where the appropriate subsample is selected in a purposive sample (Belcher et al. 2006). Key informants have also been used to find purposive samples (Barany 2006). Both random and purposive sampling can also be combined to produce a strong sampling method (Albertin & Nair 2004, Godambe 1982).

There is no limit on how many informants must make a purposive sample, as long as the information needed is obtained (Bernard 2002). Seidler (1974) studied different sample sizes from purposively selected informants and found that at least five informants were needed so that data could be relied on.

This study aims to find out how many aircraft passengers know the regulations regarding to limitation of liquid capacity, to analyze the level of knowledge of passengers about the safety standards of liquid usage on aviation. Reviewing whether this regulation has been effective or not to all passengers or prospective passenger aircraft regarding flight safety standards that can be affected by liquid objects.

2.1 The Basic Principle of Correlational Survey Method

According to Gay (1981: 183) correlational research is sometimes treated as descriptive research, mainly due to correlational research describing an existing condition. However, the conditions described in self-reports or observation studies; a correlational study describes, in quantitative terms the degree to which variables relate. Correlational research involves collecting data to determine whether, and to what degree, there is a relationship between two or more quantifiable variables. Relationship levels are expressed as a correlation coefficient. The purpose of correlational studies is to determine the relationship between variables, or to use these relationships to make predictions. (Quantitative & Qualitative Education Research Methodology Prof. Dr. Emzir, M.Pd

2.2 Correlational Survey Method Implementation

This research method uses a sample of 50 correspondents with correlational variables X and Y variables, variable X represents Knowledge of Passengers to variable Y represents Flight Safety. If the correlation coefficient for all items has been calculated, it is necessary to determine the smallest number that can be considered "high" enough as an indicator of consistency between the item score and the overall score. In this case there are no strict limits. The main principle of selecting items by looking at the correlation coefficient is to look for the highest possible price coefficients and get rid of any items that have a negative correlation (-) or coefficients that are close to zero (0.00).

According to Frieden berg (1995) in Sugiyono (2008) usually in the development and preparation of psychological scales, the minimum correlation coefficient is equal to 0.30. Thus, all items have a correlation. less than 0.30 can be set aside and the items that will be included in the test tool are items that have a correlation above 0.30 with the understanding that the higher the correlation is close to one (1.00) then the better the consistency (validity) .

3. Discussion and Result

Table 1. The Result of Descriptive Statistics

Descriptive Statistics			
	Mean	Std. Deviation	N
Knowledge of Passengers	15.3400	3.73953	50
Flight Safety	11.4000	2.34738	50

Table 2. The Result of Correlations

Correlations			
		Knowledge of Passangers	Flight Safety
Knowledge of Passengers	Pearson Correlation	1	.445**
	Sig. (2-tailed)		.001
	N	50	50
Flight Safety	Pearson Correlation	.445**	1
	Sig. (2-tailed)	.001	
	N	50	50

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

If the significant value is < 0.05 then there is a correlation between the two variables but instead if the significant value is > 0.05 then there is no correlation between the variables. Based on result of a simple correlation test in the table above, obtained significant data (2-tailed) both of variable are 0.001, so we can conclude that one variable and the other has a relation because of significant value is < 0.05 .

The correlation coefficient (R) between knowledge of Pasengers variables (X) and Flight safety (Y) is 0,445. Based on the correlation interpretation guidelines proposed by (sugiyono, 2012), it can be conclude that there is a strong correlation between knowledge of Passengers variables (X) and flight safety (Y).

Table 3. The Result of T test

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Knowledge of Passengers	50	15.3400	3.73953	.52885

One-Sample Test

	Test Value = 0					
	T	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Knowledge of Passengers	29.006	49	.000	15.34000	14.2772	16.4028

The results of the t value calculated using SPSS are 29.006, with a significance number of 0.000 it is smaller than the 0.05 significance. t table for $df = 50 - 1 = 49$ is 2.009 T table with Thitung value = $29.006 > t \text{ table} = 2.009$ then H_a is accepted, that is there is a relationship between knowledge and awareness of passengers carrying Liquid to Flight Safety

From the results of the above hypothesis there is a relation between the influence of knowledge of passengers carrying Liquid for flight safety because it is in accordance with the results of the hypothesis which shows that the count is greater than the table so that H_0 is rejected and H_a is accepted.

Table 4. The Result of Determination Coefficient R Square

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.445 ^a	.198	.181	2.12450

The table above explains the correlation value (R) is 0.445. From the output, coefficient of determination (R square) is 0.198. It means the effect of independent variable (knowledge of Passengers) to dependent variable (flight Safety) is 19.8% and 80.2% is affected by other factors.

4. Conclusion and Recommendation

This study shows that passengers know enough about ICAO Letter Number: US 8/11-06 / 10 concerning the Recommended Security Control Guidelines for Screening LAGs. On March 6, 2007. regarding the prohibition of carrying Liquid into the aircraft to support safe and comfortable flight safety. Passenger knowledge of Liquid has a relationship with flight safety. This is clearly evident from the results of the calculation of a strong and unidirectional correlation coefficient, 0.445 and is a relationship, while

the coefficient of determination of knowledge of Liquid with flight safety of 19.8% is a contribution of passenger knowledge of the regulations made about the prohibition of carrying Liquid above the limit determined by efforts to achieve flight safety. For the rest of the coefficient of determination is influenced by other factors. Passenger knowledge about Liquid has a significant effect on flight safety.

Based on the results of the discussion and conclusions of the study, the following are suggested:

- a. For the community or users of air transport services should pay attention to the regulations issued by the Ministry of Transportation regarding carrying Liquid or LAG -based fuel goods to achieve flight safety.
- b. For further research, this research still needs to be followed up by other studies that discuss other types of Liquid or LAG, and will get better research results than previous studies.
- c. For airlines, to be more strict in providing direction and complying with the procedures that have been established.

Reference

1. Oster, C. V, Strong, J. S., & Zorn, C. K. (2013). Research in Transportation Economics Analyzing aviation safety : Problems , challenges , opportunities. *Research in Transportation Economics*, 43(1), 148–164. <https://doi.org/10.1016/j.retrec.2012.12.001>
2. Yu-Hern Chang, Meng-Yuan Liao. Reserch in *Safety Science*, Volume 47, Issue 10, December2009, Pages 1337-1345. <https://doi.org/10.1016/j.ssci.2009.02.001>
3. Yu-Chun chang. *Journal of Air Transport Management*, Volume 25, December 2012, Pages 64-66.<https://doi.org/10.1016/j.jairtraman.2012.08.010>
4. https://www.academia.edu/29061029/Regulasi_Keamanan_Penerbangan
5. IATA Dangerous Goods Regulations. 2014;320 (January):1–14.
6. <http://ncskurir.com/barang-barang-berbahaya/>
7. <http://www.cabincrewdirect.com/index.asp/> Accessed 20.10. 2010.
8. The effect of aviation safety education onn passenger cabin safety awareness. <https://sci-hub.tw/https://doi.org/10.1016/j.ssci.2009.02.001>
9. Pennganan liquid aerosol dan gels pada penerbangan internasional <http://stpicurug.ac.id/2015/04/06/penanganan-liquid-aerosol-dan-gels-lags-pada-penerbangan-internasional-2/>
10. <https://www.mapcomm.co.id/berita-26-tahukah-anda-sebotol-air-mineral-bisa-berbahaya-di-kabin-pesawat.html>
11. Barnett, A. I., & Wang, A. (2000). Passenger-mortality risk estimates provide perspectives about airline safety. *Flight Safety Digest*, 19(4), 1e12.
12. McCullagh, D. (10 August 2006). Liquid explosives threaten air travel [online]. CNET News, Available at <http://news.cnet.com/Liquid-explosives-threaten-air-travel/> 2100-

7348_3-6104475.html Accessed 11.09.12.

13. Airclaims. (2012). World aircraft accident summary (WAAS), 1990e2012. CAP 479, issue 167. London: Airclaims Ltd.
14. International Civil Aviation Organization. (2009). Safety management manual [pdf] (2nd ed.). Montreal, Quebec: ICAO, Available at http://legacy.icao.int/anb/safetymanagement/DOC_9859_FULL_EN.pdf Accessed 11.09.12.
15. Stolzer, A., Halford, C., & Goglia, J. (2008). Safety management systems in aviation. Surrey, UK: Ashgate
16. Barnett, A. I. (2010). Cross-national differences in aviation safety records. *Transportation Science*, 44(3), 322e332