ACCEPTANCE OF ELECTRONIC HEALTH ALERT CARD (E-HAC) FOR COVID-19 SCREENING AMONG FLIGHT PASSENGERS AT SOEKARNO – HATTA AIRPORT

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ABSTRACT

Background: Passenger screening and security checks are a familiar aspect of air travel – but the ways in which passengers are screened has changed over the years, from simple x-ray systems, to the more complex and sophisticated systems we see today, including Electronic Health Alert Card (E-HAC). Health Belief Model (HBM) constructs have widely used to explain a variety of health preventive behaviors. This study aimed to investigate the association between HBM constructs and acceptance of E-HAC.
Subjects and Method: This was a cross-sectional study conducted at Soekarno-Hatta Airport, Jakarta, in July 2021. A sample of 200 domestic and international passengers was selected at random. The dependent variable was acceptance E-HAC. The independent variables were HBM construct. The data were collected by a set of questionnaires. Association between variables was analyzed using Pearson correlation.
Results: Acceptance of E-HAC was positively correlated with attitude ($r= 0.67$; $p<0.001$), ease of application ($r= 0.72$; $p<0.001$), and perceived benefit ($r= 0.70$; $p<0.001$). Acceptance of E-HAC was negatively correlated with perceived privacy ($r= -0.44$; $p <0.001$). The association between perceived risk and acceptance of E-HAC was statistically non-significant ($r= 0.08$; $p= 0.413$).
Conclusion: Acceptance of E-HAC is positively correlated with attitude, ease of application, and perceived benefit. Acceptance of E-HAC is negatively correlated with perceived privacy.

Keywords: COVID-19, E-HAC, screening, flight passengers.

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BACKGROUND

COVID-19 is an infectious disease caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). SARS-CoV-2 is a new type of coronavirus that has never been previously identified in humans. Common signs and symptoms of COVID-19 infection include symptoms of acute respiratory distress such as fever, cough and shortness of breath. The average incubation period is 5-6 days with the longest incubation period being 14 days (Riadi, 2019). The chain of transmission of the SARS-CoV-2 pandemic is currently spreading globally, involving more than one country, so contact tracing must be carried out.

Close contacts of confirmed cases of COVID-19 should be identified according to WHO guidelines for contact tracing. Digital tools, such as cell phones and applications for contact tracing, can support and complement

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surveillance in close contact tracing (WHO, 2020).

Smartphone applications were first used as contact tracing in 2014-2016 in West Africa during the Ebola pandemic. Smartphone applications have the advantage of increasing data completeness, storage, and accuracy, compared to filling in data with paper (Danquah, 2019). COVID-19 transmission is high in asymptomatic individuals, making pandemic control by manual contact tracing impossible. The use of contact tracing apps that record close contacts and immediately notify contacts of positive cases will be enough to stop the pandemic if used by enough people. South Korea has integrated digital technology into government-coordinated mitigation processes, including screening and contact tracing. By identifying and isolating COVID-19 early, South Korea has maintained the lowest per capita mortality rate in the world (Case Fatality Rate of 0.5% COVID-19 deaths per 100,000 people) (Ferre¬tti, 2020). Applications with a similar purpose have been implemented in China. Sustained suppression of the epidemic has been achieved in China, less than 150 new cases have been reported daily from March 2 to April 22, down from previously thousands of cases daily at the peak of the epidemic (Chen, 2020).

Along with the increasing transmission of COVID-19 disease in Indonesia and new mutations of COVID 19 disease from other countries. Therefore, an adequate digital tracking instrument is needed, in order to reduce the risk of COVID-19 transmission in Indonesia. The Electronic Health Alert Card (E-HAC) system is expected to support easy access to services for all passengers, as a tracking of the risk of spreading diseases carried by passengers (Ministry of Health, 2020).

Internal data from the Soekarno-Hatta Port Health Office reports that the implementation of E-HAC from September 2020 to March 28, 2021, only amounted to 66,292 cases out of a total of 310,121 cases (21%) on international flights. In addition, there are still many implementations of E-HAC on domestic flights that do not implement E-HAC (324,000 passengers from 1,246,648 passengers) in November 2020 to March 2021. Therefore, study is needed to analyze the causes of the low passenger acceptance in implementing E-HAC (Velicia-Martin, 2021). This study aims to determine the relationship between HBM construction and E-HAC acceptance at Soekarno-Hatta Airport.

SUBJECTS AND METHOD

1. Study Design

This was a cross-sectional study conducted at Soekarno-Hatta Airport, Jakarta, in July 2021.

2. Population and Sample

A sample of 200 domestic and international passengers was randomly selected. The inclusion criteria used are as follows: (1) international flight passengers coming from abroad; (2) domestic flight passengers coming from outside the city; and (3) agreed to the informed consent. The exclusion criteria in this study were invalid E-HAC data filling and not agreeing to informed consent.

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3. Study Variables

The dependent variable is the acceptance of E-HAC. The independent variable is the HBM construct.

4. Operational Definition of Variables

E-HAC acceptance is defined as passengers implementing E-HAC and passengers not implementing E-HAC.

Perceived ease of use is defined as the degree to which a person believes that using an application will require minimal effort.

Perceived usefulness is defined as the degree to which a person believes that using the system will improve their performance.

COVID-19 risk perception is how uncertain a person feels when deciding whether to do something or not regarding the risk of contracting COVID-19.

Attitude towards the application is the user's feeling about using the application being studied.

5. Study Instrument

All samples that meet the inclusion criteria will fill out the E-HAC validation and the Technology Acceptance Model (TAM) questionnaire was expanded as the instrument used in this study.

5. Data Analysis

Data were analyzed using SPSS version 21.0 software with Pearson correlation test.

RESULTS

1. Sample Characteristics

On domestic flights, the majority of passengers are aged 17–15 years (53%), the education level is high school as many as 52 people (48%), a history of comorbidity is often found in international passengers, international passengers understand more about E-HAC rules as many as 64 people (57 %) (Table 1).

2. Attitude and behavior profile using E-HAC

Table 2. shows the results that attitudes to use E-HAC, trust in applications, perceptions of ease of application and perceptions of application benefits for domestic passengers are better than international flight passengers.

3. Factors influencing behavioral intention to use E-HAC

Table 3. shows that E-HAC acceptance is positively correlated with attitudes ($r= 0.67$; $p<0.001$), ease of application ($r= 0.72$; $p<0.001$), and perceived benefits ($r= 0.70$; $p<0.001$). E-HAC acceptance was negatively correlated with perceived privacy ($r= -0.44$; $p <0.001$). The relationship between perceived risk and acceptance of E-HAC was not statistically significant ($r= 0.08$; $p= 0.413$).

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Table 1. Sample Characteristics (n=200)

Variable	Domestic flights (n=100)		International flights (n=100)		p
	n	%	n	%	
Age					
17 - 25	36	36.0%	32	31.4%	0.550
26 - 35	29	29.0%	32	31.4%	
36 - 45	14	14.0%	24	23.5%	
46 - 55	18	18.0%	9	8.8%	
> 55	3	3.0%	5	4.9%	
Education					
No formal education	1	1.0%	4	4.0%	0.016
PS graduate	5	5.0%	22	21.8%	
JHS graduate	8	8.0%	6	5.9%	
SHS graduate	52	52.0%	50	49.5%	
College	34	34.0%	19	18.8%	
Comorbid diseases	3	3%	12	12%	0.015
Behavior of not using E-HAC	50	50%	65	65%	0.032
Passengers understand the mandatory rules of E-HAC	57	57%	64	64%	0.810
Level of restriction (Domestic)					
Level 4	96	96%			
Level 3	4	4%			
Zoning Risk (International)					
High			14	14%	
Moderate			14	14%	
Low			72	72%	

Table 2. Attitude and behavior profile of using E-HAC

Variable	Domestic flights		International flights		p
	Mean	SD	Mean	SD	
Attitude to use E-HAC (score 3-15)	12.0	1.6	10.5	1.8	0.001
App privacy issues (score 3-15)	8.7	2.2	8.9	2.6	0.557
Trust in the application (score 3-15)	11.7	1.7	10.1	1.7	0.001
Perception of convenience (score 5-25)	19.6	2.5	17.3	3.3	0.001
Perceived benefits (score 3-15)	11.6	1.6	10.4	2.0	0.001
COVID-19 risk perception (score 4-23)	16.1	3.3	15.9	2.9	0.649
Intention to use E-HAC (score 3-15)	11.5	1.5	10.9	2.0	0.689

Table 3. Relationships between attitude, perceptions of privacy issues, trust, the risk of COVID-19, and intention to use E-HAC

Variable	Intention to behave using E-HAC	
	r	p
Attitude to the application	0.67	<0.001
Ease of application	0.72	<0.001
Application benefits	0.70	<0.001
Perceived privacy	-044	<0.001
COVID-19 risk	0.08	0.413

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DISCUSSION

The sample data in this study consisted of domestic and international flight passengers with digital questionnaires at Soekarno-Hatta Airport. The majority of domestic flight passengers are aged 17-25 (36%) years, while for international flight passengers, the 17-25 year age group is the same as 26-35 years old (32 percent each). The education level of flight passengers, both domestic and international, is dominated by high school graduates (52% and 56%). More comorbid illnesses were found among international passengers (12%) than domestic passengers (3%).

There are differences in the level of use of E-HAC for domestic and international passengers, 50% of domestic passengers use E-HAC, while only 35% of international passengers use E-HAC. The level of knowledge of passengers on the mandatory rules of E-HAC is also different, namely 57% for domestic passengers, and more, namely 64% of international patients who know that there are regulations that require the use of E-HAC.

There are differences in the zoning of domestic and international passengers, i.e. almost all domestic passengers come from level 4 PPKM zones. Meanwhile, on international flights, the domicile of passengers is divided into high, medium, and low risk, with the majority of passengers coming from zones with a high risk of COVID-19 transmission. low (72%). Demographic data of the sample shows that passengers on domestic flights are better than international passengers in implementing E-HAC.

The results of this research data indicate that the behavioral intention of flight passengers to use E-HAC is related to several factors, both for domestic and international passengers. Passengers' attitudes and beliefs about the E-HAC application are positively related to the intention to behave using E-HAC. This finding is in line with the study by f et al which stated that better attitudes and beliefs towards the application of E-HAC increased the behavioral intention of passengers to use E-HAC.

The results of this study also have some differences compared to the previous study by Velicia-Martin et al. (2021) who found that concerns about the transmission of COVID-19 for passengers and their families influenced their behavioral intentions to use the application positively. In addition, in previous studies, the importance of privacy concerns was found to not significantly affect the behavioral intention of passengers to participate in contact tracing efforts, while the results of the current study stated that privacy concerns were negatively related to behavioral intentions using E-HAC (Velicia-Martin et al., 2021). This is due to differences in the number of sample populations and differences in sample characteristics on the importance of privacy and health.

This study proves that the attitude of using E-HAC is positively related to the perception of the convenience and benefits provided by the E-HAC application. The perception of the ease of using the E-HAC application increases the attitude of passengers to use E-HAC. Likewise with the benefits, the more useful the E-HAC application, the attitude of passengers to use E-HAC will increase. The results of this study

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are in line with the study by Velicia-Martin et al., 2021 which states that user perceptions of the convenience and benefits of contact tracing applications are the biggest factors influencing user acceptance of the application (Velicia-Martin et al., 2021). There is a difference in the strength of the correlation, namely a strong correlation for passengers on domestic flights, while for passengers on international flights there is a moderate correlation (Velicia-Martin et al., 2021).

From this study, various conclusions can be drawn, namely as follows: (1) The attitude of domestic and international flight passengers towards the implementation of E-HAC is positively related to the behavioral intention of passengers to use E-HAC; (2) Domestic and international flight passengers' trust in E-HAC is positively related to the behavioral intention of passengers to implement E-HAC; (3) The perception of the risk of COVID-19 on domestic and international flight passengers is not related to the behavioral intention of passengers to use E-HAC; (4) The issue of privacy in the use of E-HAC is negatively related to the behavioral intention of domestic and international flight passengers to use E-HAC; (5) Ease of use of E-HAC is positively related to attitudes towards the use of E-HAC for domestic and international flight passengers; (6) The benefits felt by domestic and international flight passengers are positively related to the attitude of using E-HAC; (7) Factors that influence the acceptance of flight passengers in the implementation of E-HAC include attitudes, beliefs, privacy issues, perceptions of convenience, and perceptions of benefits in using E-HAC.

This research has successfully demonstrated the factors that influence the use of E-HAC. However, the sample size used in this study was relatively small and only taken from one research site. Therefore, further research is needed to examine aspects of the convenience and benefits required by airline passengers in using E-HAC.

AUTHOR CONTRIBUTION

Deni and Budi S conceptualize and analyze the data in this study. Aria K developed the methodology and analyzed the data. Budi S acts as supervisor.

CONFLICT OF INTEREST

There is no conflict of interest in this study.

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