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# Analysis of Understanding, Perceived Vulnerability, Perceived Severity, Attitude, Subjective Norm, and Perceived Behavioral Control towards Willingness to Fly during COVID-19 Pandemic in Indonesia

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*Abstract* - **Amongst many industries impacted by the COVID-19 pandemic, tourism and travel has been one of the most affected by the pandemic situation. Aviation industry, specifically passenger carriers as one of the key industries in the tourism and travel is facing a challenge in recovering from the pandemic situation with less people flying due to risks imposed by the virus. The main theory of the research framework is using Theory of Planned Behavior (TPB) to predict aviation consumer's willingness to fly. Using Structural Equation Modeling (SEM) based on Partial Least Square (PLS), this research will analyze the correlation between consumer's understanding and perception of the COVID-19 pandemic and their willingness to fly during the COVID-19 pandemic situation. This study found that understanding of the pandemic significantly influences willingness to fly through perceived behavioral control. The result of this study could be used in shifting aviation industry approach to attract consumer during the pandemic.**

*Keywords*- **Coronavirus, aviation, willingness to fly, travel intention**

## I. INTRODUCTION

Since its first outbreak in Wuhan, China in early 2020, the Coronavirus Disease 2019 (COVID-19) have been spreading in rapid pace across China and around the world. Due to the means of transmission prevention of the virus, which involved reducing direct human interaction and avoiding crowds, the prevention methods of coronavirus have resulted in major impact in the travel and tourism industry.

In the first quarter of 2020, the COVID-19 disease has caught global attention, including media, health organizations, and researchers. In April 2021, The International Civil Aviation Organization (ICAO) have reported about 60% decline in world total passengers as shown in Figure 1 resulting in approximately USD 370 billion loss in the revenue for airlines across the globe [1].

Boston Consulting Group (BCG) considered various scenarios and key indicators to predict the recovery pattern for aviation post COVID-19 pandemic from the data of previous crisis, such as the SARS epidemic. However, forecasts of the current crisis are found to be more severe compared to previous ones. This creates a situation where the industry needs to manage structural demand changes and megatrends, and cater to the passenger's health concern as it may curb passengers' intention to fly [2]. The same source also implied that there might be distinction in the rebound pattern for flight demand. Short-haul leisure flights are expected to rebound once passengers are reassured that traveling are safe again, while long-haul leisure flights are expected to rebound at slower rate since it usually takes more time to plan.

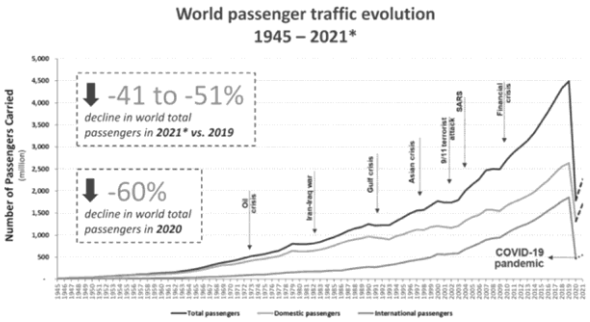


Fig. 1. World passenger traffic trend (source: ICAO, 2020).

## II. LITERATURE REVIEW

### A. Protection Motivation Theory (PMT)

The protection motivation theory (PMT) is a cognitive appraisal process triggered by fear, which concerns the severity of threat, the probability of the threat occurring, and the efficacy of coping mechanism [3]. PMT is widely used in studies concerning health and psychological well-being. The extended version of PMT is constructed using four main components: threat appraisal includes 1) Severity, the degree of extremity of the threat; 2) Vulnerability, or the probability of the threat happening; and coping appraisal which includes; 3) Response Effectiveness, or how effective the coping mechanism. is and 4) Self-Efficacy, which measures the level of confidence in the coping mechanisms.

These four components are affecting an individual's behavioral intentions in response to risk, which ultimately predicts the behavioral outcome [3]. The objective of PMT is to recognize and assess the threat, and then counter this threat with an effective mitigation option, thus making PMT applicable to many social problems beyond health promotion and disease prevention sector [4].

The factors associated PMT, namely perceived vulnerability and perceived severity had significant effects on attitude, subjective norm and perceived behavioral control [5]. The concept of self-efficacy is

already present in both TPB and PMT through perceived behavioral control, thus the coping appraisal concept in PMT is are still included in the research model. This research will attempt to correlate both PMT and TPB components to predict willingness to fly as behavioral intention.

### *B. Theory of Planned Behavior (TPB)*

The theory of planned behavior uses three independent determinants of intention. The first determinant is Attitude towards the behavior, which translates into the degree of an individual's favorable or unfavorable appraisal of the behavior. The second determinant is subjective norm, which translates into the perceived social pressure to perform or not to perform said behavior. The third antecedent of intention is the perceived behavioral control, which refers to the perceived level of control, or perceived ease in performing or not performing a behavior in relation to the individual's past experiences and anticipated obstacles [6]. In TPB, the attitudes, subjective norm, and perceived behavioral control is the core component that predicts behavioral intent and health-related behavior [7].

The application of inclusion of other factors in TPB are found in several studies [5], [8] and the same concept is adapted in this research. Previous study integrated TPB elements with protection motivation theory (PMT) and found that the factors from PMT, namely degree of understanding, perceived vulnerability and perceived severity can be applied to evaluate perceived effectiveness in COVID-19 prevention measures through intentional behavior [5]. TPB also have been used in multiple studies related to travel and tourism [8]–[10]. Intra-pandemic perception have been used as an extension of TPB [8]. The research indicated that there is strong relationship between intra-pandemic perception towards TPB elements. Different research included perceived moral obligation and environmental concern to predict intention to visit green hotels and verified that the extended TPB model have good exploratory capabilities in predicting intention [9].

### *C. Willingness to Fly*

The notion of willingness has been widely explored and discussed in a wide variety of academic studies. The construct of willingness across different literatures implied that the construct of willingness is formed in relation with the individual's inclination to engage or to experience a specific set of circumstances. Case in point includes analysis on willingness to work under disaster [11], analysis of transport automation [12], and sustainable industry [13].

Willingness to fly is a scale that have been used in numerous studies related to aviation consumer and industry personnel which measures the inclination of an individual to fly in different circumstances, for example, willingness to fly in an autonomous aircraft [12], [14], [15]. However, most studies utilizing willingness to fly scale to predict factors affecting it, and little to no studies correlated different theories such as TPB to willingness to fly. Previous study [8] linked the three components of TPB to post-pandemic travel behavior, thus this research will interpret willingness to fly as a metaphorical form of travel behavior.

### *D. Conceptual Model*

The conceptual model of this research is adopted from an PMT-TPB integration model which analyzes the factors affecting perceived effectiveness of COVID-19 prevention measures in Luzon, Philippines [5]. The model is used to predict perceived effectiveness of COVID-19 prevention measures through adapted behavior and actual behavior. However, traveling during pandemic may not be feasible to every layer of the public due to previously mentioned reasons (e.g., government restrictions, situational attributes). Thus, we believe measuring actual travel behavior may not be feasible in the context of uncertain periods such as COVID-19 pandemic, as situational attributes may have influenced respondents' decision-making process. The integration of PMT and TPB is also found in previous research [16] to predict intention and behavior to pollution control, this model explains the potential of threat appraisal process, which includes perceived vulnerability and perceived severity as a predictor for intention.

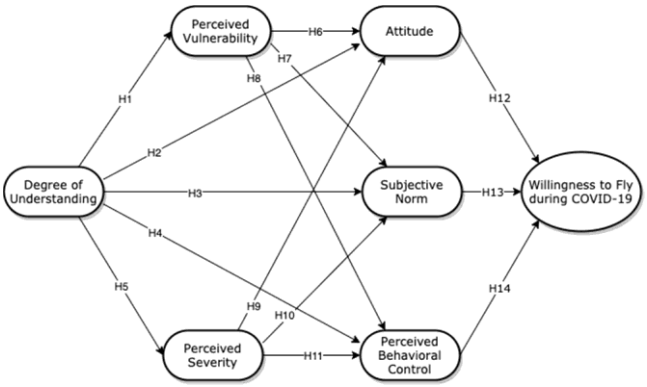


Fig. 2. Proposed research model.

Previous study indicates that attitude, subjective norm, and perceived behavioral control have significant influences in post-pandemic travel behavior [8]. The study also found that large portion of the respondents intended to take their next travel six months or longer after the pandemic had subsided.

Integrating both PMT-TPB integration and relationship between TPB components and travel behavior from earlier models, we adopted the willingness to fly scale [17]. It is important to note that the context used in this research is flying during the pandemic, thus we adjust our hypothesis based on empirical findings from previous research and used assumptions based on logical approach. Willingness to fly is used as the

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endogenous variable as a theoretical equivalent of travel intention.

*E. Hypothesis*

Previous studies explained that early knowledge on a disease helps to measure the public's perception of risk and their behavior towards risk [18]. Different research suggested that providing information and creating awareness regarding pandemics helps in reducing the fear of the spread of the disease [19]. Study on threat information in 2003 found a significant relationship between threat information and fear and risk control, thus, individuals need to be convinced to threat information in order to adapt with health promotion behavior [20]. Therefore, hypothesis is formulated:

H1. Understanding of COVID-19 have positive effects on perceived vulnerability.
H2. Understanding of COVID-19 have positive effects on perceived severity.

A health-related study in 2016 found that secondary-school students in Nigeria had negative approach towards Ebola disease due to lack of knowledge [21]. A related study found that a great number of the general population is unaware of the severity and prevention measures of H1N1 pandemic [19]. Therefore, hypothesis is formulated:

H3. Understanding of COVID-19 have positive effects on attitude

Subjective norm is defined as a desire to conform with society views and perceptions for an individual to behave in a certain way [22]. Previous study has reported that the behavior of an individual is affected by the norm in their community [23]. Previous study indicated that understanding of COVID-19 had significant effect on subjective norm and that the higher the level of understanding among community members resulted in higher group standard [5]. Thus, hypothesis is formulated:

H4. Understanding of COVID-19 have positive effects on subjective norm

Degree of understanding and perceived behavioral control have been frequently found to have effects on of individuals' tendency to follow prescription, and later conform to treatment procedures [24]. Empirical results from previous study found that understanding of COVID-19 had significant direct effects on perceived behavioral control [5]. Moreover, misunderstanding and misconception of medical instructions is often closely related to health-literacy [25]. Thus, we hypothesized the following:

H5. Understanding of COVID-19 have positive effects on perceived behavioral control.

In TPB, the attitudes, subjective norm, and perceived behavioral control is the core component that predicts behavioral intent and health-related behavior [7]. In protection motivation theory, perceived vulnerability is an essential component in the threat appraisal process in the assumption that people are actively engaging in the process of determining risk which subsequently translates into behavior [26]. However, literatures discussing integration between PMT and TPB is minimum. The factors associated with PMT, namely perceived vulnerability and perceived severity had significant effects on subjective norm and perceived behavioral control [5]. Thus, hypothesis are as follows:

H6. Perceived vulnerability has positive effects on attitude.
H7. Perceived vulnerability has negative effects on subjective norm.
H8. Perceived vulnerability has negative effects on perceived behavioral control

Previous research suggested that perceived risk involves changes in consumer behavior with the intention to avoid or decrease unfavorable results from a behavior [27]. Anxiety, fear, nervosity, depression and stress are the most frequently mentioned issues as result of the COVID-19 pandemic [28], [29]. In previous researches, perceived severity is shown to have significantly associated with attitude and subjective norm [5], [30].

H9. Perceived severity has positive effects on attitude.
H10. Perceived severity has positive effects on subjective norm.

Although perception of threat may have a role in forming precautionary motivation, perceptions of response efficacy may predict intentional formation and the actual behavior [31] Perceived severity is found to have significant effects on perceived behavioral control towards implementation of prevention measures [5]. As flying during COVID-19 pandemic could be considered as risk behavior, our logical assumption is that the higher the perceived severity of COVID-19 will result in lower perceived behavioral control to fly during the pandemic. Thus, we hypothesized the following:

H11. Perceived severity has negative effects perceived behavioral control

TPB is widely used to predict intentional and behavioral related studies such as willingness to purchase green vehicles [32], use of electronic tickets [33], and post- pandemic planned travel behavior [8]. Recent study indicates that there is an increase in intention to use private transportation and decline in the intention to use public transport in planned travel post COVID-19 pandemic [8]. However, Li (2021) uses post-pandemic as research context. Adjusting to this research context which

is during pandemic, the hypothesis formulated are as follows:

H12. Attitude have negative effects on willingness to fly.

Prior studies indicated there are several factors affecting people's willingness to follow health protocol (e.g., wearing mask), namely perceived norms, trust in healthcare, empathy, political ideology, and fear of COVID-19 [34]. Subjective norms is found to have significant effects on post- pandemic travel intention [8] and visiting green hotels [9]. Therefore, bringing air travel into context, we hypothesized as follows:

H13. Subjective norm has positive effects on willingness to fly.

Perceived behavioral control is found to have significant effects on behavioral intentions across various literatures [5], [9], [10]. The variables of behavioral intention are directly affected by the three components of TPB [35]. Self-efficacy is found to be a significant predictor in performing task behavior [36]. Thus, hypothesis is formulated as follows:

H14. Perceived behavioral control have positive effects on willingness to fly.

It is not a stretch to say that air travel by far is the fastest and the most efficient way to travel long-distance and currently have little to no substitute. This research model will attempt to correlate the TPB factors to willingness to travel, specifically air travel in the form of willingness to fly.

## III. Methodology

### A. *Measurement Tools*

The indicator measuring tool for each construct is modified from using 1-5 and 1-7 scale to 1-6 scale due to the possibility that respondents may use a midpoint as a dumping ground when responding to survey items they are not familiar with, or to items that are ambiguous or socially undesirable [37]. Therefore, the modification of the scale is done to achieve the following: 1) maintaining consistency between questionnaires for easier statistical analysis; 2) to avoid central tendency in odd-numbered scale where respondents tend to choose the median choice. Pre-testing is conducted prior to data collection.

### B. *Participants*

The population target for this research is Indonesian citizen or resident who are familiar with or have experience in flying with an aircraft in domestic or international route. Sample respondents are Indonesian citizen with various backgrounds in occupation, level of education, and income. The sampling method is using non-probability in the form of convenience sampling, based on ease of effort and time in selecting locations to gather the samples. The questionnaire was distributed using mobile platform messenger.

### C. *Data Analysis Methods*

The measurement model analysis is conducted to ensure that the indicator is suitable to measure the latent variable in the research model. The measurement model analysis mainly consists of two methods of testing, validity test and reliability test. The convergent validity of the measurement indicator is tested using loading factor and average variance extracted (AVE).

In addition to the convergent validity, discriminant validity test will also be conducted to ensure the loading factor of the indicator have the highest correlation to its target latent variable compared to the other latent variable. The discriminant validity of the measurement model is tested using the Fornell-Larcker Criterion. Once the validity test is conducted and the invalid indicators is removed, reliability test will be conducted using Composite Reliability and Cronbach's Alpha. The conceptual model will then be simplified using the valid indicators based on previous tests. The purpose of structural model analysis or Inner

Model Test is to analyze the relationship between all latent variables in the simplified conceptual model. The structural model analysis is conducted using R-Square, path coefficient, t-statistics, and predictive relevance.

## IV. Results

TABLE I. Demographic Characteristics

| Characteristics | Category | N | % |
|---|---|---|---|
| Age | < 21 | 120 | 40,0% |
| | 21 - 30 | 116 | 38,7% |
| | 31 - 40 | 30 | 10,0% |
| | 41 - 50 | 14 | 4,7% |
| | 51 - 60 | 15 | 5,0% |
| | > 60 | 5 | 1,7% |
| Gender | Male | 105 | 35,0% |
| | Female | 195 | 65,0% |
| Education | SMP | 2 | 0,7% |
| | SMU/Sederajat | 104 | 34,7% |
| | D3/Vokasi | 21 | 7,0% |
| | S1 - Sarjana | 152 | 50,7% |
| | S2 - Magister | 19 | 6,3% |
| | S3 - Doktoral | 2 | 0,7% |
| Travel During Pandemic | No | 177 | 59,0% |
| | Yes | 123 | 41,0% |
| Purpose of travel | Vacation | 123 | 41,0% |
| | Visiting friends & family | 64 | 21,3% |
| | Education | 56 | 18,7% |
| | Business trip | 57 | 19,0% |

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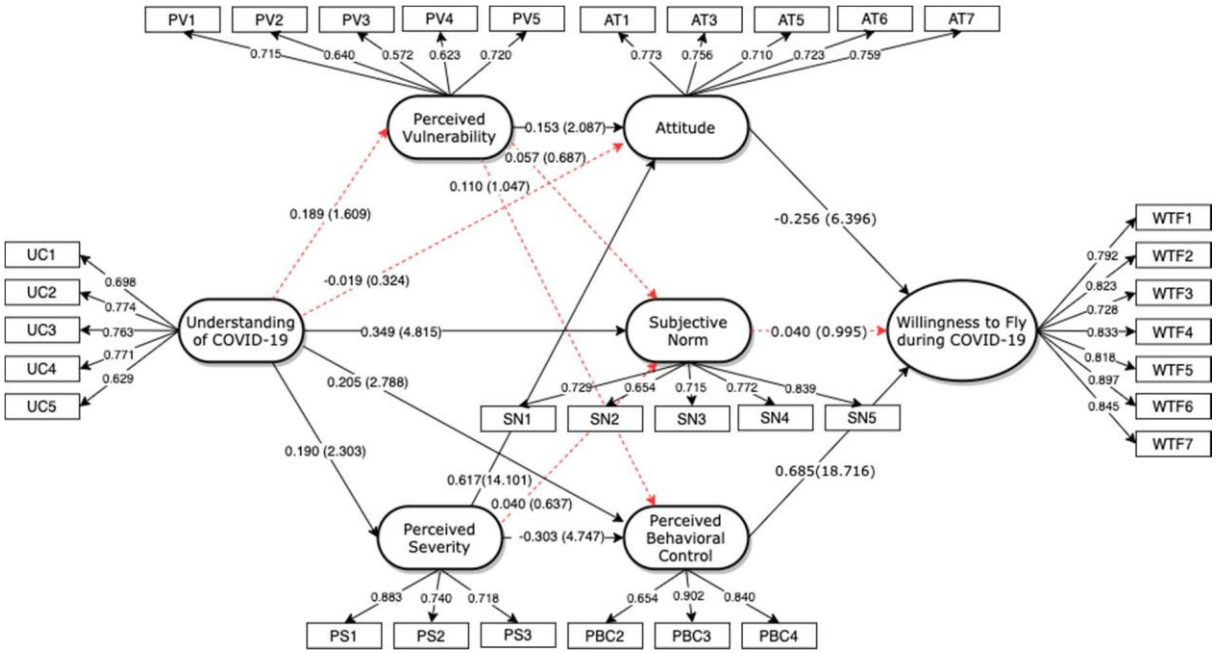


Fig. 3. Final SEM results.

The respondents in this research are Indonesian citizen who have experience or familiar with flying in domestic or international route. We collected the characteristics data in the questionnaire of total 300 respondents with various backgrounds as shown in Table 1.

Result of the data analysis shows that understanding of COVID-19 had insignificant direct effects on Perceived Vulnerability with p = 0.189, T = 1.609, and P = 0.108. However, understanding of COVID-19 is found to have significant positive direct effects on Perceived Severity (p = 0.190, T = 2.303, P = 0.021). Based on the results of the data analysis, the result of the hypothesis testing are as follows:

H1. Understanding of COVID-19 have positive effects on perceived vulnerability is rejected.

Several studies have shown that people from older age group experience higher fatality rate from COVID-19 compared to their younger counterparts, which may also explain why older age groups perceived themselves as more vulnerable to the disease [38], [39]. A large portion of respondents in this research is coming from the younger age group (< 21 years old) at 40.0%, this may be the case why the data shows that the respondents perceived themselves as less vulnerable to COVID-19.

H2. Understanding of COVID-19 have positive effects on perceived severity is accepted.

SEM indicated that understanding of COVID-19 had insignificant negative direct effects on attitude (p = -0.019, T = 0.324, P = 0.726), significant positive direct effects on subjective norm (p = 0.349, T = 4.815, P = <0.001), and significant positive direct effects on perceived behavioral control (p = 0.205, T = 0.788, P = 0.005). Comparing the data to the hypothesis, conclusions are drawn as follows:

H3. Understanding of COVID-19 have positive effects on attitude is rejected.

The indicator with the highest loading factor for Understanding of COVID-19 is UC2 (*I do understand the incubation period of COVID-19*) and UC4 (*I do understand the protocol if I have symptoms that might lead to COVID-19*). However, both indicators have relatively high coefficient of variation among the indicators in understanding of COVID-19 which implies that the variability of the answers from the respondents is high in these indicators. This may explain why understanding of COVID-19 had no significant effects on attitude.

H4. Understanding of COVID-19 have positive effects on subjective norm is accepted.
H5. Understanding of COVID-19have positive effects on perceived behavioral control is accepted.

Result of the data analysis shows that perceived vulnerability had significant positive direct effects on attitude (p = 0.153, T = 2.087, P = 0.037), insignificant positive direct effects on subjective norm (p = 0.057, T = 0.687, P = 0.492), and insignificant positive direct effects on perceived behavioral control (p = 0.110, T = 1.047, P = 0.295). Comparing the data to the hypothesis, conclusions drawn are as follows:

H6. Perceived vulnerability has positive effects on attitude is accepted.
H7. Perceived vulnerability has positive effects on subjective norm is rejected.

Previous studies indicated there are several factors affecting people's willingness to follow health protocol (e.g., wearing mask), namely perceived norms, trust in healthcare, empathy, political ideology, and fear of COVID-19 [34]. However, in this study, perceived vulnerability is found to have no significant effects on subjective norm and perceived behavioral control. An attempt to analyze the statistical results found that PV1 (*I think I am very vulnerable to COVID-19*) and PV5 (*I think there is a chance that my family will be infected by COVID-19*) as the indicator with the highest loading factor for perceived vulnerability has among the highest coefficient of variation in the group. This implies that the answers varied between respondents and that the general idea of perceived vulnerability is different among the respondents. This may explain the insignificance of perceived vulnerability towards subjective norm and perceived behavioral control. Further studies need to be conducted to fully analyze this phenomenon.

H8. Perceived vulnerability has positive effects on perceived behavioral control is rejected.

Perceived vulnerability is also found to have no significant effects on the level of confidence of the respondents to fly during COVID-19 pandemic. As COVID- 19 is a national scale issue, government plays a significant role in forming the perception of the citizen. According to Storopoli (2020), perceived vulnerability is also influenced by trust in government, healthcare, and media [40], and that confidence in social institutions reflects the public's belief that social institutions have the competency, knowledge, and ability to manage a major public health crisis [41]. This is all the more relevant because Indonesia as one of the countries with highest fatality rate due to COVID-19 outside China is considered highly polarized, and experts agree that official figures in Indonesia significantly underestimates the scale of the issue [42]. Further research is suggested to look at the topic at hand using this perspective.

Perceived severity is shown to have significant positive direct effects towards Attitude (p = 0.617, T = 14.101, P = < 0.001). This implies that people who thinks COVID-19 is a serious disease is more likely to worry about the number of people infected by COVID-19. The result is aligned with previous researches regarding perceived severity and attitude inclination during COVID-19 where perceived severity is shown to have associated with positive attitude (e.g. An et al., 2021; Prasetyo et al., 2020). Therefore, our hypothesis on perceived severity effects on attitude is supported by the data. The results of the hypothesis testing are as follows:

H9. Perceived severity has positive effects on attitude is accepted.

The indicator with the highest loading factor in perceived severity is PS1 (*I find COVID-19 is a serious disease.)* and PS2 (*I find COVID-19 can lead to death.*). This implies that the respondents agree that COVID-19 is a serious disease and could lead to death as the topic that best represents perceived severity. Meanwhile the highest loading factor in attitude emerges from AT1 (*I worry about the number of people infected by COVID-19.*) and AT7 (*I feel insecure if someone sneezes or coughs next to me.*) which discusses about worry and anxiety towards number of people infected by COVID-19. From the result we can imply that people who thinks that COVID-19 could lead to death will more likely to feel unsafe when other people sneezed or coughed near them.

H10. Perceived severity has positive effects on subjective norm is rejected.

SEM indicates that perceived severity had insignificant effects on subjective norm (p = 0.040, T = 0.637, P = 0.524). These relationships are in contrast with Prasetyo (2020) where perceived severity had significant positive effects on subjective norm. Analyzing the indicators for both perceived severity and subjective norm, the indicator with the highest loading factor for perceived severity is PS1 (*I find COVID-19 is a serious disease.*), PS2 (*I find COVID-19 can lead to death.*) and PS3 (*I find COVID-19 is more severe than any other disease.*). while the indicator with the highest loading factor in subjective norm is SN5 (*Most people I know, are doing physical distancing.*) followed by SN4 (*Most people I know are using hand sanitizer*). These indicators have relatively high coefficient of variation (above 0,2) which indicates that there is high variability in the respondents' answers.

H11. Perceived severity has positive effects on perceived behavioral control is accepted.

SEM indicates that perceived severity had significant negative direct effects on perceived behavioral control (p = -0.303, T = 4.747, P = < 0.001). Based on the indicators, this result indicates that people who thinks that COVID-19 is more severe than other diseases are less confident in their capability to fly during COVID-19 pandemic. Analyzing the indicators in both variables, the indicator with the highest loading factor in perceived severity is PS1 (*I find COVID-19 is a serious disease.*) and PS2 (*I find COVID-19 can lead to death.*) which assesses whether the respondents perceived COVID-19 as a serious disease and could lead to death, whereas the indicator with the highest loading factor in perceived behavioral control is PBC3 (*I am confident that I can fly during COVID-19 pandemic*) which discuss about the confidence level of the respondents to fly during COVID-19 pandemic, and PBC4 (*I am confident that I have*

*enough knowledge about flying during COVID-19*) which discusses about confidence in the level of knowledge to fly during COVID-19. This result supports our hypothesis where higher perceived vulnerability will result in lower perceived behavioral control.

Results from the data analysis indicated that Attitude have significant negative direct effects on willingness to fly (p = -0.256, T = 6.396, P = < 0.001), subjective norm had insignificant positive direct effects on willingness to fly (p = 0.040, T = 0.995, P = 0.320), while perceived behavioral control had significant positive direct effects on willingness to fly (p = 0.685, T = 18.716, P = < 0.001). Therefore, the result of hypothesis testing are as follows:

H12. Attitude have negative effects on willingness to fly is accepted.

Attitude having negative association with willingness to fly (p = -0.256, T = 6.396, P = < 0.001) implies that people who are concerned with the number of people infected by COVID-19 are less likely to feel confident to fly during COVID-19 pandemic. The result also indicated that people who feels confident flying during the pandemic have less fear of having their family members infected by COVID-19. Attitude being positively associated with perceived severity and perceived vulnerability, which often intercorrelated with fear which is somewhat obvious that people who have fears of COVID-19 will be less willing to fly. Previous studies also found similar results (e.g., Lamb et al., 2020; Li et al., 2021)

H13. Subjective norm has positive effects on willingness to fly is rejected.

Subjective norm had insignificant positive direct effects on willingness to fly (p = 0.040, T = 0.995, P = 0.320). The seven indicators used to measure willingness to fly generally have high loading factor. However, the coefficient of variation among the willingness to fly measurement items is found to be high (above 0,3). This implies that the variability in answers from the respondents is high and that there is no general consensus within the respondents towards the answers of willingness to fly. As willingness to fly uses a relatively new measurement instrument, the accuracy of the measurement could still be improved. Further researches are also suggested to formulate instruments to measure subjective norm using air travel as a context.

H14. Perceived behavioral control have positive effects on willingness to fly is accepted.

Perceived behavioral control is found to be a significant predictor for willingness to fly (p = 0.685, T =18.716, P = < 0.001). Based on this result, we can imply that people who are confident in their knowledge regarding COVID-19 will feel safer when flying during COVID-19 pandemic. This result supports our hypothesis where higher perceived behavioral control will result in higher willingness to fly. The result is also aligned with previous research where perceived behavioral control have positive effects on post- pandemic travel [8].

## V. CONCLUSION

### *D. Conclusion*

Based on the results of this study, it is shown that perceived behavioral control or self-efficacy of flying during the COVID-19 pandemic have positive effect on willingness to fly. In order to increase willingness to fly, it is essential to improve confidence in flying to increase perceived behavioral control through providing sufficient and accurate information regarding means of transmission of the disease, as well as the protocols and prevention measures of COVID- 19.

In addition, attitude is found to have negative correlation with willingness to fly. This result implied that in order to improve willingness to fly, passengers' or potential passengers' worry and anxiety regarding the number of people infected by COVID-19 need to be minimized. This anxiety could be reduced if the people are convinced that while COVID-19 is a serious disease and could lead to death, the risk of infection could be minimized by understanding the incubation period and means of transmission of the disease.

Surprisingly, subjective norm is found to have no significant effects on willingness to fly, which contradicts the finding from previous researches. This result implied that whether or not the respondents are surrounded by people who are complying to health protocols, such as physical distancing and wearing masks, will not shift their intention to fly during the pandemic. However, the measurement item for subjective norm is norms towards general prevention measures of COVID-19. Thus, future studies are suggested to develop contextual measurement items for subjective norm towards flying during the pandemic.

This research integrated Protection Motivation Theory (PMT) with Theory of Planned Behavior (TPB) as previously developed by Prasetyo (2020) to predict factors affecting willingness to fly and found that the level of understanding of COVID-19 and perceptions of risk towards the disease have several effects on behavior and the willingness to fly of Indonesian public during COVID-19 pandemic. Several results are in contrary with previous studies, due to differences in demographics profile and socio- economic environment.

### *E. Limitations & Future Researches*

There are constraints for both theoretical and technical aspects, also several gaps that could not be covered fully in this research. The theoretical constraints include the possibility that the components of TPB may be bi-directional [44]. To put it in context, people who already have intention to fly formed may have their attitudes and perception of risk shifted in order to justify

their behavioral decision. Recent study also found that the behavioral outcome may be different from the initially formed intention [45]. This research does not incorporate the needs of the individual in forming an intention, people willing to fly during COVID-19 pandemic does not necessarily mean they are going to fly if the need to fly does not exist. This study also does not account for past flying experiences.

The technical constraints author faced in writing this research includes time and resource constraints. There are limitations in time to fully develop new measures to be used in this research. In addition, as mentioned in the data collection section, this research is using convenience sampling method which may not be able to represent the whole Indonesian population.

Government and media have a pivotal role in forming risk perception for the public [40]. It is highly possible that people in the same demographic group may have different perception towards COVID-19. The risk perception towards COVID-19 may also have been altered by recent mass distribution of vaccine doses in Indonesia, which in turn may affect willingness to fly in the future. Therefore, future research is suggested to put these aspects into account.

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