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The Effect of Tourist's Knowledge of COVID-19 on Tourist's Holiday Intention:

Mediating Role of Social Risk and Aversion Attitude

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***Abstract*—Since early 2020, the development of COVID-19 transmission is spreading worldwide and all countries are impacted, including Indonesia. The impact of COVID-19 in Indonesian tourism industry are estimated to decrease the number of international flight attendant up to -86% and international tourist up to -60%, with the potential risk of 13 million workers in tourism industry to temporary or permanently loss their job. With the uncertainty of how and when the tourism industry in Indonesia will can be fully operate, it is important to understand the behavior intention of the tourist during COVID-19 pandemic. Drawing from Knowledge-Attitude-Behavior theory, this research aims to determine the role of tourist's knowledge of COVID-19, social risk perception and risk aversion attitude in predicting tourist's holiday intention. Quantitative explanatory approach and partial least square-structural equation modelling are used in this research. A total of 650 sample collected through respondent-driven sampling from 8 regions in Indonesia are processed in smartPLS 3.0. The result show that tourist's knowledge of COVID-19 is negative significantly affect tourist's social risk perception and positive significantly on risk aversion attitude. Directly, both tourist's social risk perception and risk aversion attitude are negative significantly affect tourist's holiday intention. Meanwhile, social risk perception failed to mediate the relationship of tourist's knowledge of COVID-19 and holiday intention, but tourist's risk aversion attitude is successfully mediate the relationship.**

Keywords—knowledge-attitude-behavior theory, covid-19 knowledge, risk perception, risk attitude

I. INTRODUCTION

Coronavirus is a group of viruses from the *Orthocronavirinae* subfamily in the *Coronaviridae* family and the order *Nidovirales*. This group of viruses can cause disease in birds and mammals, including humans. In humans, the coronavirus causes generally mild respiratory infections, such as colds, although some forms of the disease are similar to SARS and MERS, but COVID-19 are even more deadly [1]. In current conditions, the corona virus is not an epidemic that can be ignored. COVID-19 symptoms may resemble those of other illnesses that are common among people, such as diarrhea and pneumonia. Due to a lack of awareness, among other factors, care seeking was often delayed for such cases. Currently in 2020, the development of this virus transmission is significant because its spread is worldwide and all countries are feeling the impact, including Indonesia.

As of August 2020, the Government of Indonesia announced there are 160.165 confirmed cases of COVID-19, with 6.944 deaths and 115.409 recovered cases from 485 districts across all 34 provinces [1]. Further, the number of suspected cases tested for COVID-19 with polymerase chain reaction (PCR) was 20.520 and the cumulative number of suspected cases tested was 1.212.468.

The proportion of people that recovered among the total confirmed COVID-19 cases was 72.1% and there were 37.812 cases under care or in isolation [1]. The effort to anticipating and reducing the number of corona virus cases in Indonesia has been carried out in all regions. The government providing policies to limit crowd's activities through implementing online learning for students and work from home for workers since March 2020. Although as of early July 2020 there are places like shopping center, tourist destination and workplace are reopening with strict health protocol for visitors.

The impact of COVID-19 in Indonesian tourism industry are estimated to decrease the number of international flight attendant up to -86% and international tourist up to -60%, with the potential risk of 13 million workers in tourism industry to temporary or permanently loss their job [2]. With the uncertainty of how and when the tourism industry in Indonesia will can be fully operate, it is important to understand the behavior intention of the tourist during COVID-19 pandemic.

Risk perception is the foundation for the analysis of contingency on the tourism sector [3]. Because of wellbeing crisis caused by pandemic, the behavior of individuals is subject to a significant impact from risks. There are some research that found perceived risk as better predictor for tourist's behavior rather than perceived value [4,5]. This research aims to determine the tourist's holiday intention in the

context of COVID-19 pandemic through the lens of knowledge-attitude-behavior (KAB) model by using tourist's knowledge of COVID-19, perceived social risk and risk aversion attitude as the antecedents.

As a mature model that has been applied in medical and education research, KAB model divides the change in tourist's behavior in three continuous steps: gaining knowledge, forming belief and shaping behavior. Although several studies regarding tourist's behavior in early stages of COVID-19 pandemic has applied the theory of planned behavior [6–8], but the knowledge variable were not the focus of the research.

The application of KAB model in this research is specifically designed to analyze the relationship between tourist's knowledge, attitude and behavior by constructing the COVID-19 knowledge-risk perception-behavior and COVID-19 knowledge-risk aversion attitude-behavior. As it is hard for tourist to willingly go on vacation surrounded by high risk of transmitted by the COVID-19, this research provide reference for tourism sites to considers tourist's risk perception and carefully planning the development and protocol of tourism.

II. METHODS

Quantitative approach and explanatory method were used in this research. Explanatory method was conducted to discover the issue that have not examined in-depth within the past investigation and can be valuable in understanding the issue decisively. The primary purpose of explanatory method is to analyze the relationship between the variables that related to the research problem [9].

During travel restriction regulation in order to minimize the outspread of COVID-19 throughout several regions in Indonesia, this research used both accidental and snowball sampling to avoid direct contacts with respondents. From a total of 800 questionnaires distributed online via Google Forms, a total of 650 valid questionnaires were recovered, with the recovery rate of 82.25%, thus can be concluded as an effective recovery rate [10].

The data were collected from June to July 2020. From the respondent-driven sampling, most of the respondents were reside in Jakarta (38.5%), male (52.3%), aged between 25-30 years old (32%), holds a bachelor's degree (54.2%) and undergoing a travel restriction in their region (85.7%). This research used questionnaires with Likert's 5 points scale as the data collection technique. Structural Equation Modeling (SEM) with Partial Least Square (PLS) approach using smartPLS 3.0 were implemented to analyze the research's results.

A. Hypothesis Development and Conceptual Framework

Chai, Cao and Long [11] verified the negative relationship between risk knowledge and risk perception. Another research found that tourist's subjective knowledge significantly reduces their risk perception [12]. Liu [13] stated that "knowledge weakening hypothesis of public risk perception" and their study found negative effect of risk knowledge on public risk perception.

H1. Tourist's knowledge of COVID-19 has negative and significant effect on tourist's social risk perception.

In medical research field, research found a positive relationship between health knowledge and aversion attitude in Chinese college student [14]. Another research also found the positive effect of related knowledge on hypertension patient's aversion attitude [15]. In financial research field, research also found a positive relationship between financial knowledge and risk aversion attitude [16,17]. In this research, we argue that the understanding of COVID-19 risk knowledge will reduce tourist's risks acceptance and eventually increase their risk aversion attitude due to direct effect of disease risk to tourist's health.

H2. Tourist's knowledge of COVID-19 has positive and significant effect on tourist's risk aversion attitude.

Hua, Liu and Li [18] found that tourist's risk perception after Wenchuan earthquake negatively affects tourist's holiday intention to Sichuan tourism industry. Another research also found that Chinese tourist's social risk perception negatively affect their holiday intention to Japan [19]. Due to ongoing COVID-19 pandemic in Indonesia, this research argue that tourist's social risk perception is still high.

H3. Tourist's social risk perception have negative and significant effect on tourist's holiday intention.

In researching specific consumer behaviors, there is differences in acceptance of risk among individuals [20]. People that demonstrated risk aversion attitude can change their buying behavior if there is an increase in their perception of risk. For example, research found that risk-averse people chose to be vaccinated to reduce their risk of infected by hepatitis B [21]. Therefore, this research argue that tourist's aversion attitude will leads to their avoidance to be infected by COVID-19 disease.

H4. Tourist's risk aversion attitude has negative and significant effect on tourist's holiday intention.

As demonstrated in medical research field, research by Zhang, Chi and Wu [14] and Zheng, Wang and Wang [15] found that sample's attitude successfully mediates the relationship between health-related knowledge and health-related behavior. Therefore, in this research, by applying KAB theory to the tourism research, we argue that tourist's attitude (tourist's social risk perception and risk aversion attitude) will mediate the relationship between tourist's knowledge about COVID-19 and tourist's holiday intention.

H5. Tourist's social risk perception mediates the relationship between tourist's knowledge about COVID-19 and tourist's holiday intention.

H6. Tourist's risk aversion attitude mediates the relationship between tourist's knowledge about COVID-19 and tourist's holiday intention.

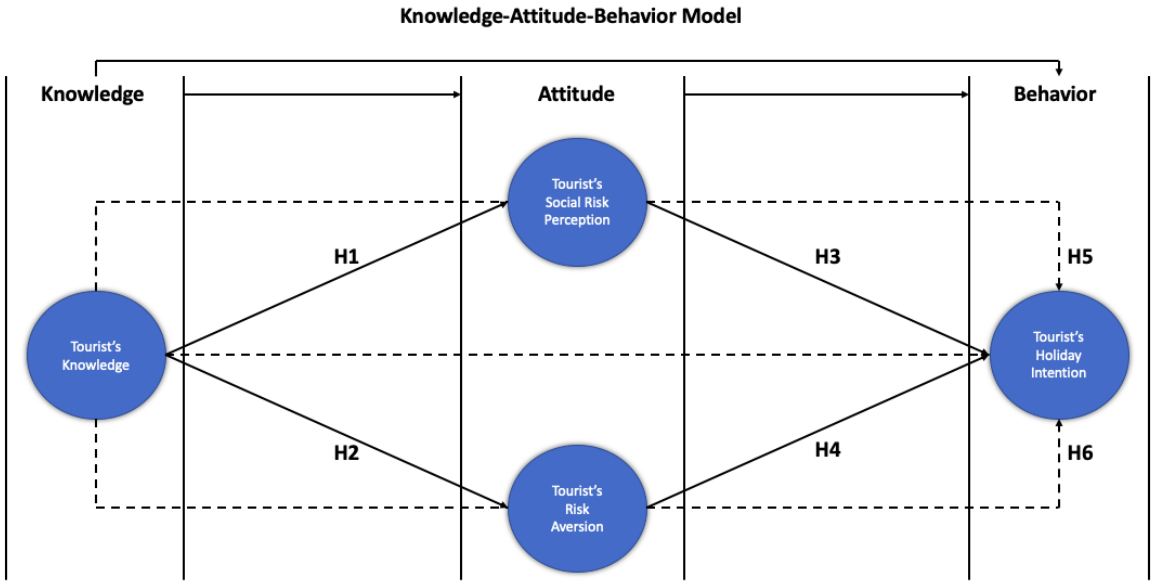

Fig. 1. Conceptual and hypothesis model.

B. *Measurement*

Tourist's knowledge of COVID-19 were measured by 5 items [22]. Tourist's social risk perception were measured by 3 items [23]. Tourist's risk aversion attitude was measured by 3 items [24]. Tourist's holiday intention was developed in this research specifically using 1 item. The use of single item in tourist's holiday intention were justified by the narrowness of construct's scope, unidimensional and unambiguous to the respondents [25].

C. *Validity and Reliability*

Evaluation criterion for the loading factor's value in PLS-SEM is expected to be > 0.7 [26]. The overall value of each item's loading factor was found to be higher than 0.7, the loading factor's details are presented in Table I. For the single-item construct on tourist's holiday intention, the result is not reported since the single-item indicator's outer loading is fixed at 1.00 [9].

TABLE I. LOADING FACTOR

Variable	Item	Loading Factor
Tourist's Knowledge of COVID-19	TKC1	0.780
	TKC2	0.848
	TKC3	0.756
	TKC4	0.719
	TKC5	0.801
Tourist's Social Risk Perception	SOC1	0.866
	SOC2	0.897
	SOC3	0.826
Tourist's Risk Aversion Attitude	ATT1	0.933
	ATT2	0.848
	ATT3	0.848

The results of Cronbach's alpha shows to be > 0.60, composite reliability > 0.70 and AVE > 0.50 and concluded as a reliable instrument [26], the details of reliability test are presented in Table II, but as tourist's holiday intention is measured by single-item construct, interpreting its Cronbach's alpha and AVE is not meaningful [9].

TABLE II. CRONBACH'S ALPHA, COMPOSITE RELIABILITY AND AVE

Variable	Cronbach's Alpha	Composite Reliability	AVE
Tourist's Knowledge of COVID-19	0.842	0.887	0.611
Tourist's Social Risk Perception	0.829	0.898	0.746
Tourist's Risk Aversion Attitude	0.849	0.909	0.770

The calculation of discriminant validity using Heterotrait-Monotrait Ratio (HTMT) shows the original HTMT values for each combination of constructs in the model [9], along with the average HTMT values computed from the 5,000 bootstrap samples. The columns labeled 2.5% and 97.5% show the lower and upper bounds of the 95% (bias-corrected and accelerated) confidence interval. As presented in Table III, neither of the confidence intervals includes the value 1. The bootstrap confidence interval results of the HTMT criterion also clearly speak in favor of the discriminant validity of the constructs.

TABLE III. HETEROTRAIT-MONOTRAIT RATIO

Variable	Original Sample (O)	Sample Mean	Bias	2.5%	97.5%
TK -> SRP	-0.415	-0.436	-0.021	-0.185	-0.562
TK -> RAT	0.290	0.303	0.013	0.066	0.443
SRP -> HI	-0.278	-0.281	-0.003	-0.055	-0.510
RAT -> HI	-0.687	-0.693	-0.006	-0.844	-0.496

*TK = Tourist's Knowledge of COVID-19, SRP = Tourist's Social Risk Perception, RAT = Tourist's Risk Aversion Attitude, HI = Tourist's Holiday Intention.

III. RESULTS

The aim of the application of PLS-SEM is to explain the causalities between the observed variables. and to determine whether the model fits the data. PLS-SEM concentrate on optimizing the explained variance in the predicted variables [9]. SEM is calculated for its predictive capabilities by determining how well the model predicts the predicted variables. The result of R^2 and Q^2 value are presented in Table IV. After PLS-algorithm was conducted, the estimated path coefficients were calculated to determine the strength and significance of proposed hypotheses through bootstrapping, with significance level of 5% (p-value < .05). The results of path coefficients are presented in Table V.

TABLE IV. R^2 AND Q^2 VALUE

Variable	R^2	Q^2
Tourist's Social Risk Perception	0.172	0.118
Tourist's Risk Aversion Attitude	0.084	0.056
Tourist's Holiday Intention	0.328	0.296

The R^2 value shows that tourist's knowledge of COVID-19 explains 17.2% variance of tourist's social risk perception and 8.4% variance of tourist's risk aversion attitude. Tourist's social risk perception and risk aversion attitude explain 32.8% variance of tourist's holiday intention.

The data analysis results in the Q^2 value are 0.118, 0.056, and 0.296 for tourist's social risk perception, risk aversion attitude and holiday intention. This result specifies that the variables tested have satisfactorily predictive relevance [9].

TABLE V. HYPOTHESIS RESULTS

Variable	H	Original Sample (O)	T Statistics (|O/STDEV|)	P Values	Conclusion
TK -> SRP	H1	-0.415	4.568	0.000	Supported
TK -> RAT	H2	0.290	3.085	0.002	Supported
SRP -> HI	H3	-0.278	2.358	0.018	Supported
RAT -> HI	H4	-0.687	7.828	0.000	Supported
TK -> SRP -> HI	H5	-0.115	1.857	0.063	Rejected
TK -> RAT -> HI	H6	-0.199	3.066	0.002	Supported

*TK = Tourist's Knowledge of COVID-19, SRP = Tourist's Social Risk Perception, RAT = Tourist's Risk Aversion Attitude, HI = Tourist's Holiday Intention.

Based on the results that calculated from structural equation model, the p-value of the tourist's knowledge of COVID-19 towards tourist's social risk perception is 0,000 and towards tourist's social risk perception is 0.002. These results indicate that tourist's knowledge of COVID-19 has a negative significant effect on tourist's social risk perception and positive significant effect on tourist's risk aversion attitude, which implies that the first and second hypothesis was supported.

As of tourist's holiday intention, both tourist's social risk perception and tourist's risk aversion attitude caused negative significant effect with p-value of 0.018 and 0.000, which means that the third and fourth hypothesis proposed in this study was supported. The estimation results of mediating effect, tourist's social risk perception was failed to mediate the relationship of tourist's knowledge about COVID-19 and tourist's holiday intention with p-value of 0.063, but tourist's risk aversion attitude is successfully mediate the relationship with p-value of 0.002. These means that the fifth hypothesis was rejected, and sixth hypothesis was supported.

IV. DISCUSSION AND IMPLICATION

Based on the proposed "knowledge-attitude-behavior" theory, this research reaffirms that the simple linear model is applicable on tourism research field. The results above confirm that there is significant relationship between tourist's knowledge and tourist's attitude. Tourist's knowledge upon COVID-19 are found to have negative and significant effect on tourist's social risk perception, this result was also verified by other previous research [11].

Sharifpour, Walters, Ritchie and Winter [12] and Liu [13] argue that people's knowledge about certain events, or in specific cases of "disastrous" event, can reduce people's perception about the risks itself. In the context of COVID-19 epidemic, this research found that 68% of the sample are gathering information in order to understanding about COVID-19 (e.g., the symptoms, transmission of the virus and health protocol) from the internet (i.e., online news outlet and social media platforms). The result indicates that from the gathered information, tourists are successfully reducing their perception about risk of being criticize by others or if other is have negative thoughts and the disagreement from friends or family when they conduct travelling activities during the pandemic.

On the other hand, tourist's knowledge of COVID-19 are found to have positive and significant effect on tourist's risk aversion attitude, this result was also verified by other past research from different research field such as medical research [15,27] and financial research [16,17]. This result indicates that the sample from this research can be categorized as risk-averse tourists, because their knowledge about COVID-19 are successfully influence their attitude for disengaging in tourism activity during the pandemic. The higher their knowledge about COVID-19, the less likely their willingness to conduct tourism activities during the pandemic, or meeting face-to-face with people whom conducted tourism activities during the pandemic to avoid the risk of being transmitted.

The results above also confirm that there is significant relationship between tourist's attitude and tourist's behavior. Tourist's social risk perception are found to have negative and significant effect on tourist's holiday intention, this result was also verified by Hua, Liu and Li [18] and Guo, Chen and Huang [19]. The result indicates that the higher tourist's perception about risk of being criticize by others or if other's have negative thoughts and the disagreement from friends or family when they conduct travelling activities during the pandemic of COVID-19, the lower their intention to conduct holiday activities. In line with their perception of risk, tourist's risk aversion attitude also found to have negative and

significant effect on tourist's holiday intention, this result was verified by research on medical field [21]. As discussed earlier, the sample of this research can be categorized as "risk-averse tourists", as opposed to risk-takers, tourist's that belong in this category are tend to avoid the risk itself. During the pandemic of COVID-19, this type of tourist has low intention to holiday.

The mediating role of tourist's attitude also examined in this research, the result indicates only tourist's risk aversion attitude that have successfully mediated the relationship between tourist's knowledge of COVID-19 and tourist's holiday intention, as for tourist's social risk perception found to be failed to mediated the relationship. This partial mediation of tourist's attitude was similar with the study on tourist's environmental knowledge [28]. The practical implication that needs to be consider is the importance for tourists in selecting information source carefully, since the effect of knowledge was found to be significant in influencing both tourist's perception and attitude. In providing tourists with reliable and valid information, tourism sites can also participate in providing such information to the targeted tourists through company's website or social media platforms (e.g., explanation on implemented health protocol in tourism destination) to manage tourist's risk perception. As for the theoretical implication, this research provides further empirical evidence on the application of knowledge-attitude-behavior theory on tourism research, specifically during pandemic of COVID-19.

V. Conclusion and Limitation

This study reaffirms the simple linear model of knowledge-attitude-behavior theory on tourism research field. The results confirmed that tourist's knowledge of COVID-19 have negative and significant effect on tourist's social risk perception and positive significant on tourist's risk aversion attitude. Both of tourist's social risk perception and tourist's risk aversion attitude are found to have negative and significant effect on tourist's holiday intention. As for mediating role, only tourist's risk aversion attitude that is found to successfully mediating the relationship between tourist's knowledge and holiday intention. This study also inseparable from couple of limitations, first, this study used only tourist's subjective knowledge as the antecedent on predicting tourist's attitude and behavior, other factors such as psychological antecedents and government policies need to be considers for future research. Second, this study does not emphasize specific tourism destination, future research needs to consider applying certain tourism destination for better generalization of the results.

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