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Impact of anxiety and tourists' habits on their intention to vacation during and after the COVID-19 pandemic: Treatment effect analysis

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ABSTRACT

This research aims to examine how tourists' anxiety, fear, and travel habits influenced their travel intentions to Switzerland after the first wave of the COVID-19 pandemic and the relaxation of containment measures. This study uses the endogenous treatment effect method to analyze the impact of travel habits and fear on travel intentions, surveying 1042 travelers from Western Europe, India, the United States, and Switzerland and applying the two-stage least squares (2SLS) technique. The findings indicate that non-anxious tourists visiting rural areas and usually on short to medium-duration vacations were highly willing to travel. Anxious tourists who had previously traveled to ski resorts also expressed willingness to travel after the COVID-19 pandemic. In addition, non-anxious tourists typically making individual travel arrangements had greater intent to travel. This analysis suggests that positive past travel experiences increase the desire to travel despite negative factors like health risks and social distancing constraints, and the primary motivation for travel is to engage in outdoor activities as a response to confinement These results are important for travel agencies as they can leverage them to target and encourage tourists with appropriate offers and targeted promotional campaigns.

Contribution/Originality: The originality of this research lies in its examination of the impact of anxiety, fear, and travel habits on travel intentions to Switzerland after the first wave of COVID-19 using the endogenous treatment effect method. The study highlights that past positive travel experiences and outdoor activities motivate travel despite pandemic-related health risks, which has practical implications for targeted marketing strategies by travel agencies.

1. INTRODUCTION AND LITERATURE REVIEW

1.1. Introduction

In 2020, the emergence of the COVID-19 pandemic caused unprecedented public health crises that resulted in shutdowns from March onwards. This pandemic had a significant impact on society and the economy, resulting in changes in work arrangements and an increased trend toward remote working for some workers who utilized telecommuting. Additionally, the pandemic had irreversible effects on travel behavior as it brought national and international mobility to a halt. The United Nations Secretary-General, António Guterres, also acknowledged this

impact: "Tourism is one of the most important economic sectors globally. It employs 1 in 10 people worldwide and provides a living for hundreds of millions more."

A joint report by the United Nations Conference on Trade and Development (UNCTAD) and the UN World Tourism Organization (UNWTO) revealed that the COVID-19 pandemic may have led to a loss of over $4 trillion in global GDP between 2020 and 2021. However, the development of COVID-19 vaccines, including the Pfizer/BioNTech vaccine, authorized by the World Health Organization on December 31, 2020, and the subsequent vaccination campaigns in various countries offer hope of ending the pandemic worldwide. The UNWTO does not expect the tourism sector to return to normal before 2023. It is, therefore, important to analyze the travel intentions of tourists, as this will allow estimates regarding a meaningful recovery of economic activity in international tourism to be revised.

Alegre, Mateo, and Pou (2009) and Boto-García (2022) presented evidence that participation in tourism activities may show habit formation or state dependence, a concept developed by Heckman (1991), which assumes that past travel experiences determine individuals' future travel behavior. Pollak (1970) formulated a consumer behavior model that relied on habit formation and provided evidence that an individual's present preferences can be influenced by their previous consumption patterns. Based on the early consumer habit formation model (Pollak, 1970) and the concept of state dependence (Heckman, 1991), Boto-García (2022) showed that participation in the previous month increases consumers' propensity to make a tourist trip in the following period. Using Spanish data, Alegre et al. (2009) showed that the two most important determinants of the decision to consume travel and the intensity of that consumption are income and habit formation, expressed as travel consumption in the previous period. However, even if tourism activities persist over time, the COVID-19 pandemic may have influenced tourists' attitudes towards travel during the outbreak due to various uncertainties related to travel and negative emotions, including fear of contracting the virus and border closures.

The marketing literature has mainly focused on consumer behaviors and purchase intentions when discussing attitudes. As Kotler, Dubois, and Manceau (2003) stated, "An attitude summarizes evaluations (positive or negative), emotional reactions, and predispositions to act toward an object or idea." Therefore, based on this definition, tourists' habits, such as their choice of destination, length of stay, and type of tourist activities, could change depending on the circumstances and challenges presented by the global health situation. An increasing amount of literature has emerged that examines tourists' travel intentions after the end of the COVID-19 pandemic (Ahmed, Hossain, Siddique, & Jobe, 2021; Bratić et al., 2021; Chebli & Said, 2020; Chua, Al-Ansi, Lee, & Han, 2021; Rahman, Gazi, Bhuiyan, & Rahaman, 2021; Wachyuni & Kusumaningrum, 2020). The impact of the pandemic on tourism has resulted, for instance, in a change in tourists' preferences towards shorter stays (Wachyuni & Kusumaningrum, 2020). Some studies have concluded that fear of infection has led tourists to prefer destinations that are closer to home or are short-haul trips (Bratić et al., 2021; Sung, Kim, & Kwon, 2020; Wachyuni & Kusumaningrum, 2020). However, other studies have suggested that tourists' destination choices depend on a country's response to the COVID-19 pandemic. According to Chua et al. (2021), tourists' travel intentions after the pandemic are influenced by their preventive health behaviors and attachment to their destination. The growing body of literature on tourists' post-COVID travel intentions suggests that travel behaviors are influenced by several factors, such as habits and psychological factors like anxiety. Studies by Wachyuni and Kusumaningrum (2020) and Bratić et al. (2021) have suggested that while anxiety may play a role in travel decision-making, other factors related to travel intention outweigh it. The media also plays a significant role in shaping tourists' future travel intentions after the pandemic, as demonstrated by Bhati, Mohammadi, Agarwal, Kamble, and Donough-Tan (2021), who found that mass media and social networks can impact and manipulate tourists' travel behaviors. The negative impact of health risk perception on travel intention during the pandemic was addressed by Su et al. (2022), who concluded that health risk perception is indirectly influenced by information about the pandemic and can affect tourists' future travel plans through their health self-efficacy and attitude towards travel. Overall, these findings highlight the complexity of factors influencing

tourists' travel intentions in the post-COVID era. Some previous studies that examined the influence of habits on travel choices using micro-data failed to take into account important factors such as the type of trip, its duration, and the characteristics of the destination.

This study aims to address these limitations and contribute to the field by examining these specific travel attributes in relation to the impact of habit formation on travel intentions. The analysis will employ a treatment effect method to compare the effects of habit formation on travel intentions across different levels of habit, with a control group that did not engage in this type of travel, all within the context of the COVID-19 pandemic.

1.2. Literature Review

In recent studies, researchers have examined how fear and anxiety surrounding the COVID-19 pandemic have affected people's willingness to travel. Specifically, Luo and Lam (2020) studied the influence of COVID-19 fear, travel anxiety, and risk attitude on travel intentions to "travel bubble" destinations. Such destinations were travel programs developed by travel agencies that allowed people to travel to neighboring countries without having to undergo compulsory lockdown measures. The results indicated a negative influence of COVID-19 fear, as well as travel anxiety and travel risk attitude, on travel intention. In addition, travel-related anxiety and risk attitude mediated the indirect effect of fear of COVID-19 on the intention to travel.

Abou-Shouk, Zoair, and Abulenein (2022) examined the impact of COVID-19-related fear and anxiety on individuals' desire to travel, as well as the influence of protective measures implemented by the United Arab Emirates (UAE) and Egypt on travel intentions. The researchers used an Internet-based survey that collected data from a convenience sample of randomly selected respondents in the two countries and analyzed the results using a structural equation model. The study found that the perception of the protection measures taken by the UAE and Egypt was an important predictor of the travel intentions of the individuals concerned. Gastaldello, Livat, and Rossetto (2022) examined the influence of COVID-19-related fear and anxiety on enotourism travel intentions after the first lockdown.

They also considered the effects of solidarity and situation, in addition to the importance of personal engagement with the product. According to their findings, the pandemic led to changes in wine-related travel patterns, and wine tourism intentions increased after the lockdown. Interestingly, the study found that fear of contagion did not have a significant impact on wine tourism intentions. In contrast, situational involvement, such as spending time with wine during the lockdown, and willingness to support local wine producers had a positive effect.

Handler and Kawaminami's (2023) study analyzed the impact of worry on Japanese travelers' intentions to visit thermal pools during the COVID-19 pandemic. The authors identified three groups of visitors based on their self-reported perception of threat severity, infectiousness, the effectiveness of the response, self-efficacy, perceived crowding, and attitude: worried visitors, carefree visitors, and confident visitors. The study suggests various management strategies for the different visitor segments, including reducing the perception of risk for worried visitors, motivating confident visitors with external incentives, and encouraging carefree visitors by offering vouchers. Akhrani et al. (2022) conducted a study on the travel intentions of tourists in Indonesia and Taiwan during the pandemic by analyzing various factors, such as the risk perception of COVID-19, fear of COVID-19, perception of travel risk, vaccination attitude, and travel fear.

The study included a total of 641 respondents from both countries, and the data were analyzed using multiple regression and simple linear regression. The results showed that in Indonesia, all the factors mentioned above contributed to travel intentions, while in Taiwan, fear of COVID-19 failed to have any effect on travel intentions, and the model was instead formed by risk perception of COVID-19, perceived travel risk, attitude toward the vaccine, and fear of travel.

Handler and Tan (2022) conducted a market research study to explore the attitudes and feelings of Japanese traveler segments concerning national travel experiences during the pandemic. They identified six behavioral

dimensions, which included COVID-19 uncertainty and financial effects, using a factor analysis of 1,353 questionnaires. The K-means analysis of the clustering distinguished three tourism clusters: confident cross-border travelers, anxious cross-border travelers, and social cross-border travelers, each characterized by unique attitudes and socio-demographic characteristics. The authors proposed various strategies to cater to the unique needs of each travel segment. For anxious travelers, they suggest offering tour packages with minimal face-to-face contact. Confident travelers, on the other hand, can be incentivized through travel subsidies from national campaigns. For social travelers, conventional marketing campaigns may be sufficient to encourage them to travel domestically during the pandemic.

In summary, the previous literature suggests that travel intentions are negatively influenced by fear and anxiety, whereas perceived safety measures and situational awareness have a positive impact. Moreover, market segment-based management strategies, such as personalized travel packages and incentives, have been recommended to boost travel intentions.

2. METHODOLOGY

2.1. Research Problem

Recent research has argued that the travel habits of tourists have been impacted by the emergence of COVID-19 (Chebli & Said, 2020; Ertaş & Kırlar-Can, 2022; Rahman et al., 2021; Su et al., 2022). These results show that the perception of risk is a factor affecting travel behavior and that this perception depends on several factors, such as the socio-demographic characteristics of the tourist (Zhan, Zeng, Morrison, Liang, & Coca-Stefaniak, 2022) and their travel habits in terms of past experience (Karl, Kock, Ritchie, & Gauss, 2021). The objective of the current study is to assess how travel behaviors have influenced individuals' willingness to engage in leisure travel following the COVID-19 pandemic. It is believed that travel habits will induce tourists to maintain their travel behavior even if there are factors that favor their intentions to behave differently (Neal, Wood, & Quinn, 2006). These habits are the frequency of travel to preferred places, the choice of accommodations, the season of stay, the duration, and the type of holiday. Figure 1 illustrates the conceptual model

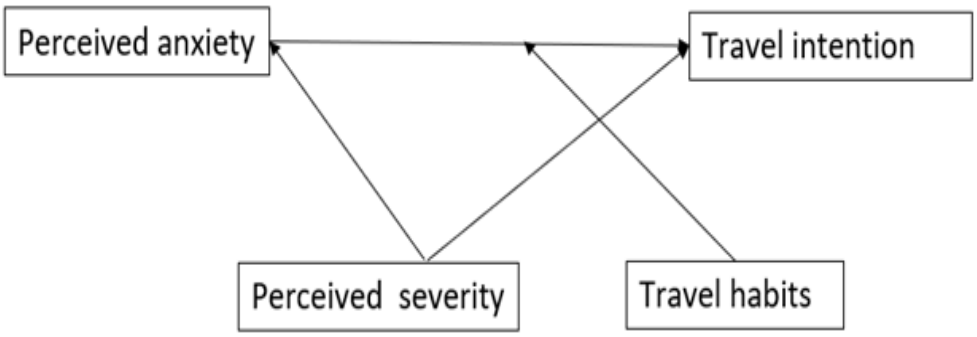

Figure 1. The conceptual model.

Şengel et al. (2023) found that travel intention varies with the level of anxiety induced by COVID-19. Similarly, Luo and Lam (2020) found a positive correlation between COVID-19 fear and travel anxiety, as well as a negative correlation between COVID-19 fear and travel intention. The above model incorporates travel behaviors to assess how previous actions may impact the desire to travel after the pandemic; in this conceptual model, the link between the variable travel intention and the degree of anxiety is endogenous, given the existence of an unobservable factor that simultaneously affects travel intention and anxiety. According to Banerjee and Basu (2021), this is a problem of endogeneity due to the observable confounders.

2.2. Research Hypotheses

Based on previous studies that showed that habits have an impact on travel intention (Havlíčková & Zámečník, 2020; Turnšek et al., 2020), we formulated the following hypotheses:

- *Hypothesis 1: Travel intention following the COVID-19 pandemic is influenced by past travel location habits.*
- *Hypothesis 2: Travel intention following the COVID-19 pandemic is influenced by past travel purpose habits.*
- *Hypothesis 3: Travel intention following the COVID-19 pandemic is influenced by past travel accommodation habits.*
- *Hypothesis 4: Travel intention following the COVID-19 pandemic is influenced by past travel duration habits in specific areas.*

2.3. Database

This study examines how travel patterns have affected people's willingness to engage in leisure travel after the COVID-19 pandemic. Data were collected through an online survey conducted by the Institute of Tourism (ITO) of the University of Applied Sciences and Arts of Western Switzerland Valais-Wallis from March to May 2020, using a quota-based sampling strategy to ensure representativeness of countries of residence. Demographic information was collected from existing census databases, and socio-demographic quotas were supplied by Cloud Research, which recruits participants from a pre-established database on the characteristics of international tourists. Survey respondents were tourists from Western European countries, India, and the United States, and the distribution of respondents by country of residence is presented in Table 1.

Table 1. Respondent repartition by country.

Residence countries	Frequency	Percent
Germany	95	9.1
Belgium	47	4.5
Spain	88	8.4
USA	88	8.4
France	104	10
India	79	7.6
Italy	88	8.4
Netherlands	49	4.7
UK	94	9
Switzerland	310	29.8
Total	1042	100

Table 1 provides the number and percentage of travelers from different countries who participated in the study conducted by the Vallais-Wallis Tourism Institute. The study includes 1042 travelers from Western Europe, India, the United States, and Switzerland. The table shows that Switzerland had the highest number of participants with 310 travelers, which represents 29.8% of the total sample. Germany, the United Kingdom, France, and Spain also had a significant representation in the study, each with over 8% of the total sample. On the other hand, countries like Belgium, the Netherlands, and India had a lower percentage of participants, each with less than 8% of the total sample.

The survey also gathered data on tourists' travel habits, including the location of their vacations, destination preferences, and types of accommodations used, which allows for an evaluation of the pandemic's influence on the desire to take a vacation. Following the exclusion of individuals with missing values on the habit variables and the desire to vacation variable, the sample size was reduced to 1,042 individuals.

2.4. Descriptive Statistics

Table 2 presents the descriptive statistics and measurement scales for the main variables used in this study. On average, respondents reported occasional visits to cities, beaches, and rural areas, but few to ski resorts. The average

age range of respondents was between 36 and 45 years old, and most had completed a bachelor's degree. The average monthly income reported by participants was $3,500.

Table 2. Descriptive statistics.

Habits	N	Minimum	Maximum	Mean	Std. deviation
City habits 1= Never. 5= Very often	1042	1	5	3.26	1.147
Ski habits 1= Never. 5= Very often	1042	1	5	2.1	1.208
Beach habits 1= Never. 5= Very often	1042	1	5	3.21	1.304
Rural area habits 1= Never. 5= Very often	1042	1	5	2.94	1.153
Age 1= - Than 18 ; 2= 18–25 ; 3= 26–35 ; …; 9= 76 and +	1042	1	7	3.7	1.735
Sex 0=male ; 1= female	1042	0	1	0.54	0.498
Education 1= Compulsory school; 2= High school; 3= Bachelor; 4= Master; 5= Doctorate	1042	1	5	2.73	1.082
Income 1= 900 € or less ; 2= From 901 to 1800 € ; 3= from 1801 à 2700 € ;…; 9= + 7200 € ;	1042	0	9	4.1353	2.592
Habits motif vacancies 1= Never 2= Only once 3= More than once	1042	1	3	2.2495	0.673
Habits motif parents 1= Never 2= Only once 3= More than once	1042	1	3	2.1075	0.875
Habitude motif professional 1= Never 2= Only once 3= More than once	1042	1	3	1.5096	0.798
Switzerland habits 0= Never visit 1 = Visit	1042	0	1	0.3138	0.465
Germany habits 0= Never visit 1 = Visit	1042	0	1	0.2649	0.442
France habits 0= Never visit 1 = Visit	1042	0	1	0.2889	0.454
Italy habits 0= Never visit 1 = Visit	1042	0	1	0.2716	0.445
UK habits 0= Never visit 1 = Visit	1042	0	1	0.2169	0.413
Other World habits 0= Never visit 1 = Visit	1042	0	1	0.2236	0.417
Hotel habits 1= Never 2= Only once 3= More than once	1042	1	3	2.1862	0.863
Para hotel habits 1= Never 2= Only once 3= More than once	1042	1	3	1.5182	0.764
Parent habits 1= Never 2= Only once 3= More than once	1042	1	3	1.7812	0.852
Habits duration 1–3 1= Never 2= Only once 3= More than once	1042	1	3	1.9299	0.887
Habits duration 4–7 1= Never 2= Only once 3= More than once	1042	1	3	1.9146	0.857
Habits duration 8–30 1= Never 2= Only once 3= More than once	1042	1	3	1.594	0.772
Habits duration more than 30 1= Never 2= Only once 3= More than once	1042	1	3	1.0797	0.3512
Summer habits 1= Never 2= Only once 3= More than once	1042	1	3	2.4328	0.7307
Winter habits 1= Never 2= Only once 3= More than once	1042	1	3	2.0662	0.8502
Travel intention From 0 to 100	1042	0	100	48.27	34.326

2.5. Data Analysis Technique: Exogenous Treatment Effect Model

To assess the impact of travel patterns on post-pandemic travel intentions, the treatment effect technique is most appropriate. This method assesses the effect of multiple treatments on an outcome variable (Cattaneo, Drukker, &

Holland, 2013). The treatment levels studied here are the frequency of travel before the pandemic and after. The treatment effect method is a new technique in social science that aims to identify the impact of a phenomenon on an experimental population compared to a control population (Lecocq, Ammi, & Bellarbre, 2014). Individuals who have undergone the phenomenon being studied are classified as the treated group (Y_1), while individuals who have not undergone the phenomenon form the control group (Y_0). If every condition is the same, then the difference between the average of all individuals who received the treatment Y_1, and the average of all individuals who did not receive the treatment Y_0 indicates the average impact of the treatment. However, it is not possible to experimentally observe an individual in both situations at the same time. Therefore, researchers use a random selection method where individuals from both groups are selected randomly (Banerjee & Duflo, 2009). The precise measurement of the treatment effect in this type of experiment requires an important assumption of homogeneity between individuals. Nevertheless, Wood et al. (2008) pointed out that this randomized controlled trial method can be affected by multiple biases.

In some fields of social sciences, it is not feasible to conduct randomized or quasi-experimental studies due to the high costs involved or ethical concerns (such as giving a drug to a random group of young people). In such cases, researchers must rely on existing observational data. However, since the choice of the variable representing the treatment is not random, it can lead to a correlation between the outcome and treatment (Fan, Sherman, & Shum, 2014). The propensity score method, developed by Rosenbaum and Rubin (1983), estimates the likelihood of treatment benefiting an individual, assuming that the outcomes obtained, given a set of observed exogenous variables, are independent of the treatment. The propensity score method forecasts the likelihood of treatment based on specific observable characteristics of the subjects, assuming that the observed outcomes are not affected by the treatment after controlling for these characteristics. This allows for a more accurate assessment of the causal effect of the treatment on the relevant outcomes. Polemis (2020) conducted a study in the tourism industry on the impact of containment measures on the performance of Italian hotels, using the treatment effect method. This method solves the issues of endogeneity and selection bias by introducing exogenous variables that condition the treatment and outcome variables, making them independent. The estimators obtained using this method allow the researcher to detect the impact of a treatment that must be assessed from observable data, and the potential outcome is used to determine this treatment effect. Rigorous assessment of the treatment effect requires potential outcomes (Y_1) that represent the theoretical values of the estimated treatment effect for the control individuals. In an experiment, we can observe the outcome Y_1 for a subject who received treatment, and Y_0 represents the potential outcome for that same subject had they not received treatment. However, this can be seen as a problem of missing data. Fortunately, the treatment effect method offers a solution to this issue.

In this study, the treatment effect method is used to estimate travel desire after the COVID-19 pandemic. The outcome variable is continuous and the treatment variable is a binary equal to one for treated respondents who expresses anxiety about the current pandemic situation and zero for non-treated respondents (control group) who expresses anxiety about the current pandemic situation. Respondents' travel habits are operationalized by an ordinal variable and represented on a Likert scale, which detects the visit frequencies to certain destinations or the choice frequencies of durations and accommodations.

The conceptual model in Figure 1 shows that the causal link between travel intention and anxiety is endogenous since there is an unobservable variable that is correlated with outcome and treatment. Banerjee and Basu (2021) showed that this counterfactual is a source of endogeneity in the model and that the use of inappropriate estimation methods may provide biased results. The best empirical model to address this endogeneity problem is the instrumental model developed by Banerjee and Basu (2021), the two-stage least squares (2SLS) model.

The estimated economic model is represented by Equation 1. The endogenous variable (T) is a binary treatment variable, the exogenous variables are the observed control variable (X), and an instrumental variable (Z), where Z is uncorrelated with the unobserved confounder θ:

$$T^* = \beta_0 + \beta_x X + \beta_z Z + \beta_\theta \theta + \epsilon \quad (1)$$

Where T* = 1 if T* > 0

Equation 2 is the first equation to be estimated in the 2SLS model; the variable Y is a continuous endogenous variable.

$$Y = \alpha_0 + \alpha_x X + \alpha_z \theta + u \quad (2)$$

The treatment effect method is used to assess the potential outcomes means (POM), which are the average Y_0 values of tourists who have never visited the destination, while Y_1 represents the desire of tourists who have visited. The average treatment effect (ATE), which is the difference between Y_1 and Y_0, represents the mean marginal treatment outcome in the total population. On the other hand, the average treatment effect on the treated (ATET) refers to individuals who received the treatment.

In order to evaluate the influence of anxiety on the willingness to travel post-pandemic using the treatment effect method, a logistic regression technique is employed on various characteristics of tourists. This creates a hypothetical population of tourists who do not possess the particular travel habit for each category of travel habit. Each individual in this population is given a weight that is inversely proportional to their likelihood of receiving the actual treatment, taking into account the value of exogenous variables x. The treatment effect method involves a two-step process. First, the propensity score (PS) is calculated, i.e., the probability that an individual will receive the treatment. This estimation relies on two important assumptions: (i) the conditional independence assumption (CIA) and (ii) the overlap assumption. These assumptions make it possible to control for selection bias by using exogenous observable variables, which can be checked for independence from assignment or treatment (Brodaty, Crépon, & Fougère, 2007). Since the variables assessing anxiety levels are binary, the probability of treatment requires a logistic model estimated for each treatment level on exogenous variables (X), following Equations 3 and 4. Equations 3 and 4 present the multinomial logit regression model, which is used when the dependent variable has at least three unordered categories. The dependent variable is the selection of treatment options, which can be treatment i, treatment j, or no treatment c, represented by the values 1, 2, and 3, respectively. The explanatory variables are denoted by the variable X. The model estimates a set of coefficients, βi, βj, and βc, corresponding to each category. The coefficients represent the impact of the explanatory variables on the selection of each category, and their values are estimated using the maximum likelihood method.

$$pr\big((z = treatment\ i|X)\big) = \frac{e^{X\beta_i}}{e^{X\beta_i} + e^{X\beta_j} + e^{X\beta_c}} \quad (3)$$

$$pr\big((z = treatment\ c|X)\big) = \frac{e^{X\beta_c}}{e^{X\beta_i} + e^{X\beta_j} + e^{X\beta_c}} \quad (4)$$

The average treatment effect for each level k, which represents travel habits, is calculated as follows: $E[Y_{-i} - Y_{0i}]$

3. RESULTS AND DISCUSSION

In this section, we analyze the pre-pandemic travel habits by applying the test of equality of proportions between the modalities to decide statistically if the travel frequencies vary according to the attributes or not. Subsequently, we present the results of the treatment effect method to analyze the effect of these habits on the travel intentions of the two treatment groups.

3.1. Travel Structure Prior to the COVID-19 Pandemic

In this section, we present the structure of travel habits according to the different attributes of the respondents' trips before the outbreak of the pandemic in 2020.

3.1.1. Travel Habits by Area

The distribution of the travel habits by area is presented in Figure 2.

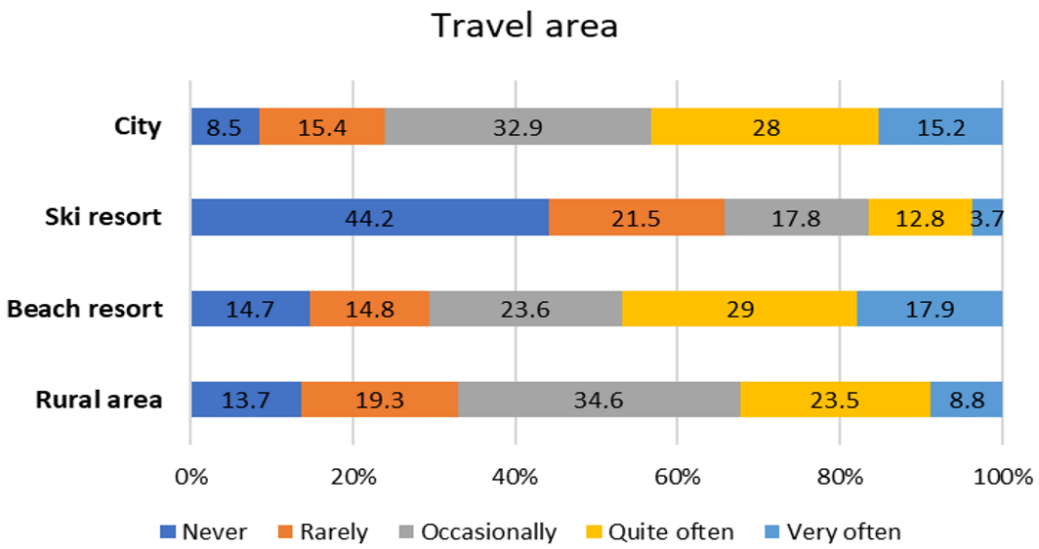

Figure 2. Distribution of habits by area.

The share of those who have never visited a city on vacation is the lowest (8.5%), while the share of those who have never traveled to a ski resort is the highest (44.2%). The share of those who visit beaches very often is the highest (17.9%). The results of the statistical tests presented in Table 3 show that the difference in proportions between the frequencies of travel for each area is statistically significant; i.e., for cities, the difference between those who have never visited (8.5%) and those who have visited very often (15.2%), is not due to risk.

Table 3. Test for equality of proportions between travel area habits.

Statistic values	City	Ski resort	Beach resort	Rural area
Chi-squared	212.309	474.948	79.948	203.969
Asymp. sig.	0.000***	0.000***	0.000***	0.000***

Note: *** $p < 0.01$.

3.1.2. Travel Habits by Motive

This section analyzes the distribution of travel patterns by trip purpose. Figure 3 illustrates the frequency of different travel motives.

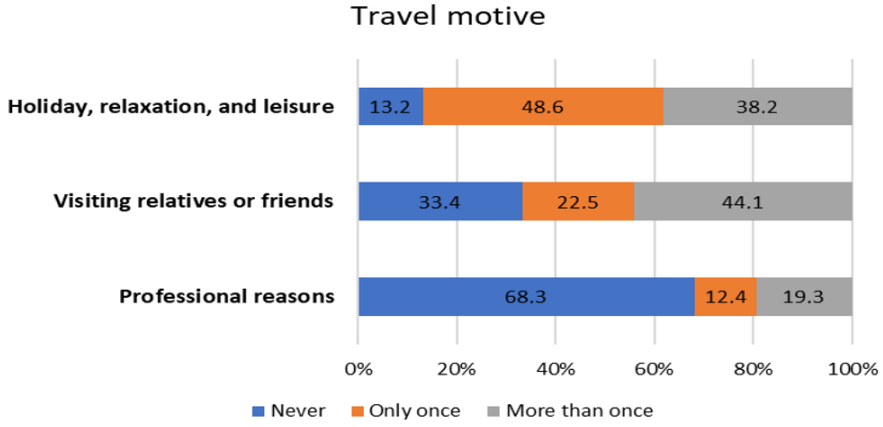

Figure 3. Distribution of habits by travel motive.

About 13.2% of respondents declared they traveled for leisure purposes; 68.3% of respondents never traveled for professional reasons; 38.2% had visited hotels more than once, and 44.1% declared that they often traveled to visit relatives or friends. Table 4 displays the results of the test for equality of proportions, these tests reject the hypothesis that the differences in proportions in due to hazard.

Table 4. Test for equality of proportions between travel motives.

Statistic values	Holiday, relaxation, and leisure	Visiting relatives or friends	Professional reasons
Chi-squared	2231.179	4044.388	6591.273
Asymp. sig.	0.000***	0.000***	0.000***

Note: ***p < 0.01.

3.1.3. Travel Habits by Accommodation

This section examines the distribution of travel patterns by accommodation. Figure 4 illustrates the frequency of different travel accommodation options.

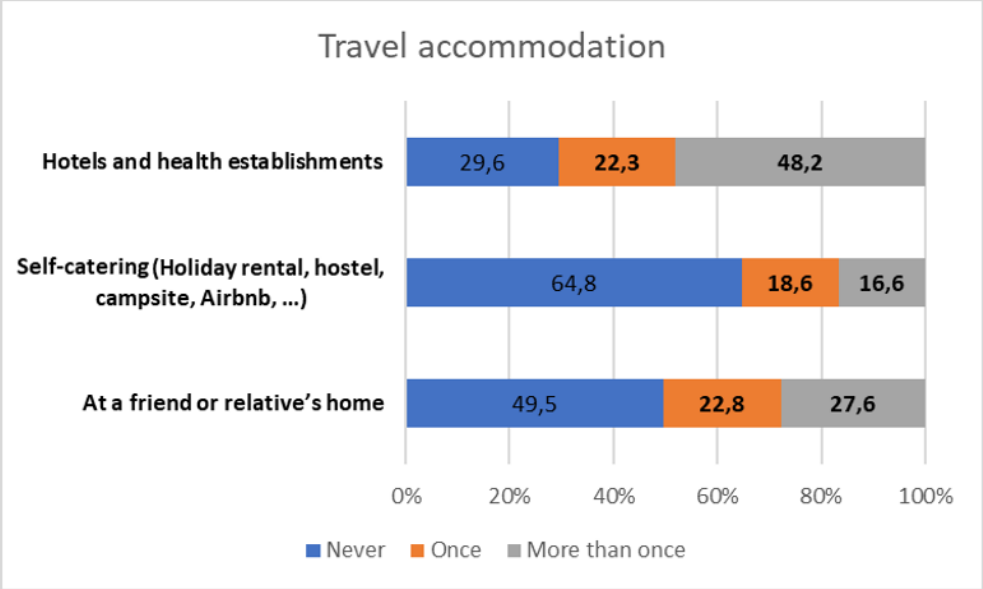

Figure 4. Distribution of habits by accommodation.

Regarding accommodation type, 48.2% of respondents had visited hotels for accommodation more than once, 64.4% of respondents never chose self-catering accommodation, and 49.5% never stayed with relatives or friends. The results in Table 5 indicate that there is a statically significant difference in the proportion of travel frequencies within each accommodation type.

Table 5. Test for equality of proportions between travel accommodation habits.

Statistic values	Hotels and health establishments	Self-catering (Holiday rental, hostel, campsite, Airbnb, …)	At a friend or relative's home
Chi-squared	2657.347	4275.138	4948.649
Asymp. sig.	0.000***	0.000***	0.000***

Note: *** p < 0.01.

3.1.4. Travel Habits by Duration

This section describes the distribution of travel patterns by duration. Figure 5 presents the proportion of respondents who opted for each duration and their frequency.

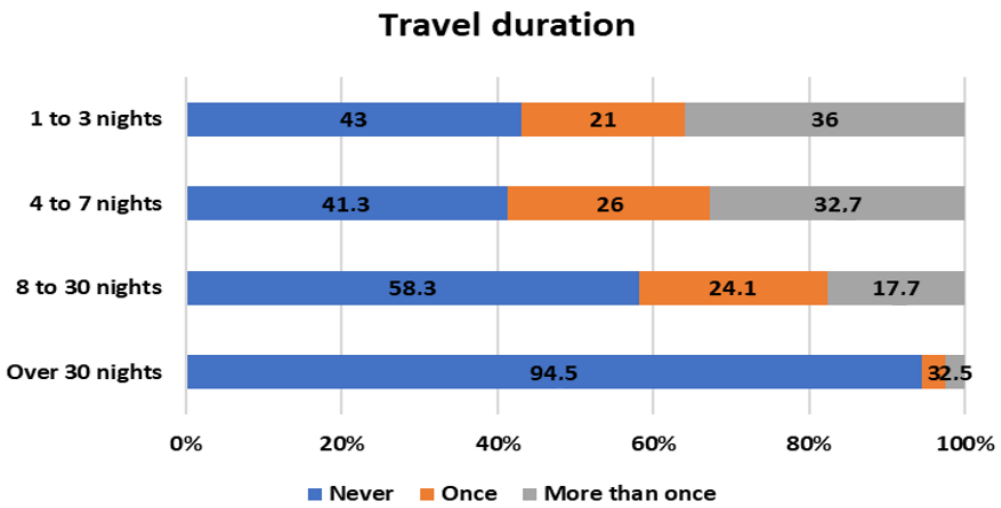

Figure 5. Distribution of habits by travel duration.

About 43% of respondents had never taken a short trip of one to three days, whereas 36% of travelers chose this option more than once. Trips of 4 to 7 days had never been undertaken by 41.3% of respondents, while 32.7% declared they had taken such trips more than once. Trips of 8 to 30 days were taken multiple times by 17.7% of respondents; 58.3% never undertook such trips. Finally, 94.4% of respondents declared they had not taken a trip longer than 30 days. Table 6 presents the results of the statistical test of the hypothesis that the distribution of respondents among the frequencies within each duration is not significant. This hypothesis is rejected, indicating that there is a significant difference in frequencies within each travel duration habit.

Table 6. Test for equality of proportions between travel duration habits.

Statistic values	1 to 3 nights	4 to 7 nights	8 to 30 nights	Over 30 nights
Chi-squared	3020.956	1827.904	6238.470	8280.764
Asymp. sig.	0.000***	0.000***	0.000***	0.000***

Note: *** $p < 0.01$.

The tables and figures above showcase the travel patterns prior to the COVID-19 outbreak. In the next section, we analyze the effect of these patterns on the intent to travel of participants who reported no anxiety related to the COVID-19 situation (control group) and those who reported anxiety related to the COVID-19 situation (treated group). To identify the impact of travel habits on the desire to go on vacation, we use a dependent variable representing the level of desire to go on vacation, ranging from 0 to 100. A score of 0 indicates no desire to travel, a score of 50 represents a neutral position, and a score of 100 indicates a strong desire to travel. Scores above 50 indicate a desire to travel, while scores below 50 indicate a reluctance to travel. COVID-19 anxiety is assessed using a binary question, while fear is measured using a 5-point Likert scale ranging from "strongly disagree" to "strongly agree." The traveler's age, education level, and gender are included as covariates in the endogenous treatment model estimation.

4. TREATMENT EFFECT ESTIMATION AND INTERPRETATION

The following tables contain the estimated results of the endogenous treatment models. These results represent the effect of each travel habit on the travel intention of each treatment group, the effect of fear of COVID-19 on travel intention in each treatment group, and the average travel intention of each treatment group. These tables also display the results of the estimation of anxiety on the control variables. The correlation coefficient between travel intention and anxiety allows us to test the endogeneity hypothesis. ATE (average treatment effect) indicates the estimated mean difference between the group that expressed anxiety versus the control group and is equal to $E[Y_{1i} - Y_{0i}]$.

4.1. Travel Area Habits

This section reports the results of the treatment model estimation for location habits, revealing the impact of these habits on the travel intentions of the group that expressed anxiety and the group that did not. The findings are summarized in Table 7.

Table 7. Treatment results for travel area habits.

Travel intention	Coefficient	Std. err.	Z	P>z
Anxiety * city				
0	-3.554	1.720	-2.07	0.039**
1	1.293	1.066	1.21	0.225
Anxiety * ski resort				
0	-2.196	1.514	-1.45	0.147
1	2.199	1.0711	2.05	0.040**
Anxiety * beach				
0	-6.160	2.825	-2.18	0.029**
1	2.253	2.637	0.85	0.393
Anxiety * rural areas				
0	3.171	1.919	1.65	0.099*
1	0.727	1.038	0.70	0.484
Anxiety * fear				
0	-6.858	2.558	-2.68	0.007***
1	-5.471	1.817	-3.01	0.003***
Anxiety				
0	105.255	13.298	7.91	0.000***
1	5.607	7.646	0.73	0.463
Anxiety				
Age	0.010	0.015	0.68	0.496
Gender	-0.090	0.050	-1.79	0.073*
Education	0.008	0.023	0.39	0.700
Fear	0.171	0.045	3.79	0.000***
_cons	0.301	0.177	1.70	0.089*
Correlation (Travel intention * anxiety)	-0.987	0.007	-140.54	0.000***
Average treatment effect	Margin	Std. err.	z	P>z
ATE (1 vs 0)	-86.728	3.617	-23.97	0.000

Note: * p < 0.1, ** p < 0.05, *** p < 0.01.

The control group comprises respondents who did not feel anxiety during the COVID-19 period, whereas the treated group comprises respondents who did feel anxiety. Travel habits to cities have a negative impact on travel intention in the control group. The same result is recorded for those who are used to visiting beaches. The habit of traveling to ski resorts has a positive effect on the travel intention in the treated group. Travel habits to rural areas increase the desire to travel in the control group. According to these results, fear has a negative effect on travel intention in both treated groups. This result shows that if we isolate the effect of anxiety for travelers with similar habits, fear positively affects negative travel intention. This result adds to recent results in the literature that confirm that the effect of fear on travel intentions is negative (Apaolaza, Paredes, Hartmann, García-Merino, & Marcos, 2022; Luo & Lam, 2020). Anxiety is higher in women than in men and is positively correlated with fear. The estimated coefficient of correlation between the errors from the travel intention model and the errors from the anxiety model is -0.98 and significantly different from zero (p-value = 0.000), indicating that the endogenous treatment model is more consistent than a standard model. The negative sign reveals that unobserved factors that increase anxiety tend to also decrease travel intention.

The estimated average treatment effect (ATE) confirms that the average travel intention scale in the population expressing anxiety (treated population) is less than the average travel intention scale in the non-anxious population by 86.7 points.

4.2. Travel Motive

Table 8 contains the results of the estimation of the endogenous model for the different travel motives, i.e., vacation, family visits, and professional motives.

The results show that the vacation habit affects the intent to travel in the control group. In the anxious group, those who travel frequently to visit relatives are less willing to travel. The habit of travelling for professional motives has no effect on travel intention, independent of the level of anxiety. Fear has a negative effect on travel intention in both treatment groups. The estimated coefficient of correlation between the errors from the travel intention model and the errors from the anxiety model is -0.98 and significantly different from zero (p-value = 0.000), indicating that the endogenous treatment model is more consistent than a standard model. The estimated ATE confirms that the average travel intention scale in the population expressing anxiety (treated population) is less than the average travel intention scale in the non-anxious population by 87.7 points.

Table 8. Treatment effect estimation of travel motives.

Travel intention	Coefficient	Std. err.	z	P>z
Anxiety * vacation				
0	6.458	2.814	2.29	0.022**
1	1.746	1.835	0.95	0.341
Anxiety * relatives				
0	0.041	0.568	0.07	0.942
1	-0.825	0.472	-1.75	0.080*
Anxiety * professional				
0	-2.797	2.764	-1.01	0.311
1	1.518	1.545	0.98	0.326
Anxiety * fear				
0	-7.539	2.629	-2.87	0.004***
1	-5.693	1.825	-3.12	0.002***
Anxiety				
0	86.184	15.108	5.70	0.000***
1	10.279	7.922	1.30	0.194
Anxiety				
Age	0.005	0.014	0.36	0.722
Gender	-0.106	0.051	-2.06	0.040***
Education	-0.001	0.022	-0.05	0.963
Fear	0.166	0.044	3.71	0.000***
_cons	0.384	0.179	2.15	0.032**
Correlation (Travel intention * anxiety)	-0.985	0.008	-118.66	0.000***
Average treatment effect	Margin	Std. err.	Z	P>z
ATE (1 vs 0)	-87.212	2.983	-29.23	0.000

Note: * p < 0.1, ** p < 0.05, *** p < 0.01.

4.3. Accommodation Habits

The results of the treatment estimation model for accommodation habits are presented in Table 9:

Table 9. Treatment effect estimation of travel accommodation habits.

Travel intention	Coefficient	Std. err.	Z	P>z
Anxiety * hotels				
0	2.132	1.932	1.10	0.270
1	0.976	1.291	0.76	0.450
Anxiety * self-catering				
0	4.163	2.351	1.77	0.077*
1	1.990	1.448	1.37	0.169
Anxiety * at relative's home				
0	-6.000	2.086	-2.88	0.004***
1	-1.050	1.271	-0.83	0.409
Anxiety * fear				
0	-5.409	2.505	-2.16	0.031**
1	-5.888	1.809	-3.25	0.001***
Anxiety				
0	103.617	12.626	8.21	0.000***

Travel intention	Coefficient	Std. err.	Z	P>z
1	11.662	7.821	1.49	0.136
Anxiety				
Age	0.009	0.013	0.73	0.464
Gender	-0.107	0.047	-2.28	0.023***
Education	0.003	0.020	0.16	0.874
Fear	0.158	0.043	3.65	0.000***
_cons	0.361	0.173	2.09	0.037**
Correlation (Travel intention * anxiety)	-0.990	0.004	-202.55	0.000***
Average treatment effect	Margin	Std. err.	z	P>z
ATE (1 vs 0)	-87.239	3.909	-22.31	0.000

Note: * p < 0.1, ** p < 0.05, *** p < 0.01.

Anxiety affected those who are accustomed to choosing hotels as their travel accommodation, since for both groups this habit has no significant effect on travel intention. Those accustomed to self-catering accommodations and not affected by anxiety have a significantly higher travel intention than those who are anxious. The intention to travel is lower among the members of the control group who generally choose to stay at a relative's house.

4.4. Duration Habits

The results of the estimation of the endogenous treatment model with duration habits are provided in Table 10.

For the non-anxious control group, travel habits characterized by a short duration of 1 to 3 days or a medium duration of 8 to 30 days significantly increase travel intention. In this same group, travel habits of more than 30 days have a negative effect on travel intention after the COVID-19 pandemic. The estimated coefficient of correlation between the errors from the travel intention model and the errors from the anxiety model is -0.99 and significantly different from zero (p-value = 0.000), indicating that the endogenous treatment model is more consistent than a standard model. The estimated ATE confirms that the average travel intention scale in the population expressing anxiety (treated population) is less than the average travel intention scale in the non-anxious population by 91.5 points.

Table 10. Treatment effect estimation of travel duration habits.

Travel intention	Coefficient	Std. err.	z	P>z
Anxiety * 1 to 3 nights				
0	9.054	2.551	3.55	0.000***
1	0.576	1.200	0.48	0.631
Anxiety * 4 to 7 nights				
0	1.825	2.591	0.70	0.481
1	1.843	1.306	1.41	0.158
Anxiety * 8 to 30 nights				
0	8.237	2.129	3.87	0.000***
1	1.727	1.422	1.21	0.224
Anxiety * over 30 nights				
0	-7.454	3.493	-2.13	0.033***
1	4.324	3.095	1.40	0.162
Anxiety * fear				
0	-11.434	2.886	3.96	0.000***
1	-5.712	1.806	3.16	0.002***
Anxiety				
0	60.522	12.770	4.74	0.000***
1	3.352	8.362	0.40	0.688
Anxiety				
Age	0.0004	0.011	0.04	0.970
Gender	-0.100	0.049	-2.05	0.041*
Education	-0.0006	0.011	-0.06	0.952
Fear	0.150	0.045	3.33	0.001***
_cons	0.408	0.176	2.31	0.021*
Correlation (Travel intention * anxiety)	-0.993	0.005	-174.53	0.000***
Average treatment effect	Margin	Std. err.	z	P>z
ATE (1 vs 0)	-91.524	4.220	-21.68	0.000

Note: *p < 0.1, **p < 0.05, ***p < 0.01.

5. CONCLUSIONS

5.1. Main Findings

This study analyzed the impact of anxiety, fear, and travel habits on tourists' post-pandemic travel intentions using the endogenous treatment effect method, based on the two-stage least squares technique and the logistic regression technique. For this analysis, we used data from an online survey conducted by the Institute of Tourism (ITO) of the HES Valais-Wallis, between March and May 2020 to analyze the travel habits of 1042 travelers from Western Europe, India, and the US. The sample was drawn using the quota technique based on the demographic characteristics of the countries.

The endogenous treatment effect technique was used to account for the non-random assignment of the treatment that relates to travel patterns and for the unobserved confounding (Banerjee & Basu, 2021). This method revealed new patterns in travel intention in the wake of the COVID-19 pandemic. The treatment effect technique allowed us to divide the respondents by anxiety level, and this division allowed us to identify the impact of travel habits for each anxiety and fear profile. The treatment effect model revealed that for the same habits and the same level of fear, the average travel intention was higher in the non-anxious group than the anxious one. Travel habits to rural areas, the habit of traveling for vacation, and habitually short and medium travel durations (under 30 days) increased travel intention in the control group comprising persons who were not anxious about COVID-19. The habit of traveling to cities or beaches and staying in relatives' homes decreased travel intention in this group. The habit of traveling to ski resorts positively impacted the intention to travel in the anxious group, while in this same group, the habit of traveling to visit family reduced the intention to travel. Fear is a factor that significantly decreases the intention to travel and increases the likelihood of feeling anxiety. Anxiety is more prevalent among women than men. This analysis indicates that individuals who have had positive travel experiences in the past are more likely to have a desire to travel in the future, despite potential negative factors such as health risks and social distancing constraints. These findings are supported by previous studies conducted by Nguyen, Pham, and Pham (2021) and Shin, Nicolau, Kang, Sharma, and Lee (2022), who also found that past travel experiences have a positive impact on travel intentions, even in the face of perceived health risks. Additionally, other studies, such as those by Hung and Petrick (2010) and Shin et al. (2022), have highlighted that social distancing measures can also act as structural barriers to travel, which can further impact travel intentions. The primary motivation to travel is the inclination for outdoor activities as a response to prolonged confinement. However, it is noteworthy that this result contrasts with the findings of Shin et al. (2022), which suggested that prior travel experience may not be a significant determinant of the decision to travel post-pandemic.

5.2. Policy Implications

The findings of this study indicate that the COVID-19 pandemic has influenced the behavior of tourists. The data reveals that the travel intentions of international tourists are heavily influenced by their pre-pandemic travel habits, as well as their levels of fear and anxiety. The study found that non-anxious tourists who frequently visit rural areas and those who typically travel for short or medium-length vacations exhibited a high willingness to travel.

Tourists who reported feeling anxious but had traveled to ski resorts before the pandemic still expressed a desire to travel after the pandemic. Similarly, non-anxious tourists who typically plan their trips independently exhibited a significantly greater willingness to travel. This research has revealed that tourists who have had allocentric travel experiences in the past, meaning those who prefer attractions to facilities (Plog, 1974), are more inclined to take risks and tend to choose destinations that are considered riskier (Litvin, Guttentag, & Smith, 2022; Papatheodorou, 2001).

Our findings may be useful for travel agencies in identifying and targeting tourists who are eager to resume travel and have a positive outlook. This can be achieved through customized promotional campaigns and attractive offers, which could be developed collaboratively with industry stakeholders like hotels, airlines, and tour operators.

Different regions, depending on their natural, cultural, or other characteristics, can customize their advertising campaigns and promotional offers to attract different types of tourists for specific activities such as skiing, beach

vacations, or city tours. This targeted approach can help to revive the tourism sector, which has suffered greatly due to the COVID-19 pandemic.

5.3. Limitations and Further Research

It is important to exercise caution when interpreting the results of this study as the survey was conducted between March and May 2020, which corresponds to the period of the initial wave of the COVID-19 pandemic. The first wave of the pandemic saw the implementation of strict containment measures, including the complete closure of borders and tourist destinations, as well as the absence of vaccines. The uncertainty caused by the COVID-19 pandemic had a negative impact on travelers' willingness to take a vacation. This could explain the low rates of travelers who expressed a desire to travel immediately after travel protocols resumed. However, with the implementation of effective vaccination programs, an increased proportion of the vaccinated population, and relaxation of containment measures to combat subsequent waves of COVID-19, the desire to travel may increase among both regular and non-regular travelers. It is important to note that the results presented in this study may differ significantly from future outcomes under these conditions. We utilized the treatment effect approach to examine the impact of past travel habits on travelers' desire to travel; however, this approach does not allow us to ascertain the underlying factors that contribute to this desire. Thus, it would be valuable for future research to investigate the determinants of variables that influence the willingness to travel after the pandemic and the potential strategies that encourage this desire.

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