

Article

Preferences for Hotels with Biophilic Design Attributes in the Post-COVID-19 Era

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Abstract: Since the COVID-19 crisis has caused the cancellation of a great number of travel plans in the last two years, this study examines the prospects of the post-COVID-19 era, during which we expect tourism will return strongly. The impact of the epidemic on people's attitudes toward tourism, particularly their tourist choices, appears to be a major challenge for post-COVID-19 international tourism development. Very little is known about tourists' accommodation preferences during the period emerging after the COVID-19 crisis. With a long and challenging experience of lockdowns, stress, and fear of disease, the current study attempts to examine peoples' preferences for hotel attributes during the post-COVID-19 era. It examines factors contributing to peoples' preferences for hotels with biophilic attributes. A total of 507 Iranian undergraduate and graduate students participated in the study. They answered questions on their perceived stress, level of depression, the specific burden of COVID-19, the perceived benefits of nature, and their preferences for biophilic design attributes in their accommodation. The online survey was conducted from August to October 2021. We found that the burden of COVID-19 increased the stress level of the respondents, which consequently increased the chance of depression. We further found that perceived stress and the benefits of nature significantly affect tourists' preferences for exposure to nature and hotels with biophilic attributes. Based on the data, we suggest that the demand for biophilic buildings will be strongly increased during the post-COVID-19 era.

Keywords: biophilic architecture; depression; tourism; wellbeing; stress; hotel design

Citation: Khozaei, F.; Carbon, C.C.; Hosseini Nia, M.; Kim, M.J. Preferences for Hotels with Biophilic Design Attributes in the Post-COVID-19 Era. *Buildings* **2022**, *12*, 427. <https://doi.org/10.3390/buildings12040427>

Academic Editor: Dirk H.R. Spennemann

Received: 28 January 2022

Accepted: 23 March 2022

Published: 1 April 2022

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1. Introduction

The World Health Organization (Henceforth, WHO) proclaimed the new coronavirus disease (COVID-19) outbreak on 11 March 2020 [1,2]. Lockdowns were first instituted in Wuhan and were later imposed on the rest of China and, eventually, the entire world. Only two months after the announcement of "coronavirus disease 2019", a worldwide pandemic, in March 2020, travel restrictions were imposed on more than 90% of people across the world [3]. The unpredictable nature of the illness, contradicting signals from authorities, economic crisis, or worries for health and well-being are all examples of stressors linked with these outbreaks and pandemics [4,5]. This was followed by indefinite lockdowns and significant and escalating financial losses.

As the globe faced various crises caused by the COVID-19 epidemic, the tourism industry was severely affected, and, consequently, flights were grounded, hotels closed, and travel restrictions were imposed in practically every country [6]. On a worldwide scale, recent years have been defined by instability and disaster. The pandemic has mercilessly

assaulted society and the economy, culminating in disastrous repercussions. Before the pandemic, the tourist industry was growing year after year.

Since the COVID-19 pandemic represents an unprecedented worldwide change condition for tourism, it is vital to conceptualize it as a pervasive backdrop and explore how it might influence the general public's tourism preferences. The impact of the epidemic on people's attitudes toward tourism, particularly their tourism choices, appears to be a major challenge for post-COVID-19 international tourism development. Little is documented about how the COVID-19 epidemic can affect customers' views on tourism. Identifying the psychological effects of a pandemic on tourism is critical as these can give a framework for understanding its impact on the whole sector.

Tourists' preferences and expectations of their destination have been examined before the COVID-19 pandemic from various perspectives. When it comes to the role of architecture and the built environment more specifically, various studies have examined the contribution of factors such as tourists' preferences for hotels and accommodation, visual servicescapes [7], interior design [8], lighting [9], and even landscape design [10] in tourists' preferences or satisfaction. More recently, several studies have concentrated on tourists' preferences for green hotels [11]. The result of these studies might be less valid for tourism preferences during the post-COVID-19 era. This is first because the COVID-19 pandemic is unprecedented and may be establishing a new social and societal norm for human life. Secondly, the nature of tourists' preferences after long-term lockdowns and travel cancellations remains unknown, and very few references in the literature cover the issue.

The current study attempts to fill a part of this gap by understanding the possible effect of COVID-19 psychological stressors on tourists' preferences regarding hotel attributes. More specifically, the current study attempts to examine if the burden of COVID-19, stress, and depression can affect people's preferences regarding their connection with nature. Since Iran is a country experiencing one of the most significant lockdowns in the last two years, in this research, we scrutinize the possible impact of COVID-19 on the tourist choices of Iranian nationals. The country has experienced a large number of lockdowns, as well as the closure of schools and public spaces. In the first three months of 2022, the country is still facing several challenges with the COVID-19 pandemic: schools and universities are operating online, and traveling to domestic destinations has not returned to normal. This study examines if the burden of COVID-19, the perceived benefits of nature, and stress can affect people's preferences for accommodations with biophilic design attributes.

2. Literature Review

2.1. COVID-19, Tourism, and Accommodation

The COVID-19 outbreak has been recognized as one of the most significant issues of the twenty-first century, with far-reaching consequences for the hospitality and tourist industries [12–15]. Many nations' hospitality and tourist sectors have essentially been shut down in terms of supply. This has put a great number of jobs in danger. The COVID-19 epidemic has caused a wide-ranging negative impact on the international accommodation business [16]. In such a confusing situation, hotel managers have no idea which products to offer to tourists when to propose them, and even how to generate profits or encourage tourists to repeat their visits [17].

To negotiate the uncharted territory created by the epidemic, hotels must reassess the current situation and propose novel solutions to guarantee the health and safety of both visitors and staff. Indeed, in response to the pandemic, many hotels have already implemented a slew of innovations [18], including ensuring higher sanitary standards, calling for booking and cancellation regulations, and enforcing social distancing [19].

As the globe is finding a way to deal with COVID-19, officials across the world are gradually restoring people's mobility and resuming hospitality and tourism services. Accordingly, tourism managers must reconsider travelers' attitudes as well as the primary

elements that drive hospitality consumption. The pandemic might influence tourist behavior when traveling, reserving accommodations, and consuming physical places.

Factors contributing to tourists' accommodation preferences have always been taken into account by researchers [20,21]. Due to the importance of the issue, several studies in the last two years have concentrated on factors contributing to customers' preferences or expectations of their accommodation during the COVID-19 and post-COVID-19 eras. Some studies have examined preferred hotel prices [22], environmental and hygienic factors such as cleanness [18], or related factors such as technological innovations for social distancing and reducing human intervention [18]. Meanwhile, very little attention has been paid to peoples' preferences for connecting with nature. The purpose of the current study is to fill a part of this void by examining whether, during the post-COVID-19 era, people prefer hotels with biophilic design attributes.

2.2. Nature and Restoration

The healing and restorative power of nature has been proved by various studies [23–28]. Restorative settings elicit pleasant moods, engage people's attention without causing them to become stressed, and help individuals achieve a rapid recovery [29]. It is believed that human beings have a widespread innate bond with nature, and such a connection can have several benefits to their health [30,31]. Cutting-edge theories, including Ulrich's "Stress Recovery Theory" [32–34], shed light on the power of natural scenes in reducing stress. According to this theory, visiting natural surroundings can help people recuperate from stress. Available studies indicate that exposure to nature might contribute to generating a good mood and decreasing stress [35]. Guo et al. [36] found that virtual exposure to campus streets with trees in the fall for a short period can be beneficial to graduate students' health. It seems that there is an association between various levels of stress recovery and different types of green spaces.

The restorative quality of nature has been examined in various settings for people with different demographic backgrounds. For example, elderly people who spend one hour in a natural environment might experience better concentration and show better daily activity performance [37]. Landscape preference theories illustrate how natural scenes might help people fulfill their innate needs. Some research has examined whether the healing impact associated with natural landscapes encourages individuals to prefer natural rather than man-made urban landscapes [38]. Despite the abundant research on the healing capacity of urban green spaces, most of the research has been approached from a general perspective, and not much exists on the impact of psychological distress on preferences for connection with nature in interior spaces.

2.3. Biophilic Architecture and Health

The philosophy of biophilia underpins but is not limited to, the concept of biophilic design. Many environmental psychology theories suggest that humans' demand for 'nature' stems from an instinctual reaction to natural components. Biophilia refers to the profound human desire to interact with nature. This probably justifies why a view of nature may boost our creativity. It may even answer our question as to why gardening or walking in a park is healing. As a theory, biophilia explains people's preferences for some urban parks and architecture [9]. Based on the biophilia theory, these beneficial impacts of nature exposure stem from a biological relationship between people and the natural world. These principles have been advanced by two major theories, namely, the attention restoration theory and the stress recovery theory [39]. According to these theories, some surroundings cause stress while others do not, and some can actively assist people in recovering from stress and mental weariness.

In the last few years, the world of architecture has paid great attention to biophilic design to create a better connection between human beings with nature regularly. Architects are already experimenting with biophilic design principles, which include new and promising ideas for bioclimatic-sensitive design. Biophilic design explicitly attempts to

shift human activities from beneath building roofs to the green and natural surroundings outdoors. Biophilic design hence implies that by including natural components into their design, built environments may develop a healing component.

Biophilic design has been defined as an approach employed in the design of buildings to address the inborn needs of people, which is nature. A fundamental issue in the biophilic design literature highlights that people have been detached from nature and this has been caused by the current architectural approach. However, human attachment is reflected in their preferences for organic building designs, materials, and shapes; nature-inspired places; and traditional life in the vicinity of nature. This attachment to nature can be traced to many years ago. Living in cities has disconnected people from nature. The missing evolutionary factor in modern cities, according to biophilic designers, is the necessity to re-establish an instinctive connection to nature in everyday life. It is thought that nature should be interwoven into all aspects of buildings, rather than separating people in buildings from nature [40].

The health and stress-reduction benefits offered by biophilic designs have been indeed supported by the growing literature. Despite the new tendency to employ the framework of biophilic design, a great number of studies existing on nature and spaces present a compelling argument for the psychological benefits of introducing biophilic design features into the built environment. The use of natural materials and processes is also encouraged by biophilic design.

2.4. Stress during COVID-19

Various studies have concentrated on peoples' stress during the COVID-19 pandemic worldwide. Studies have reported higher psychological distress during COVID-19, especially among people from countries with the highest number of cases with a longer duration of challenges caused by the pandemic [41]. Some have concentrated on stressful parenting during the pandemic [42] and some on health workers [43,44].

3. Theoretical Framework

Traveler preference is dynamic and very much dependent on various external factors such as those described in [45,46]. Travelers, for instance, chose to be in rooms equipped with phones. This is why charging for telephone services was a substantial source of income for hotels, but later, the demand for such rooms decreased and many hotels with such services started losing money. By providing free Internet, hotels are now attempting to satisfy many customers. Such shifts in travelers' preferences can have an impact on hotel performance. As a result, managers need to successfully identify the preferences of travelers. Despite this importance, few systematic studies have been carried out on this issue.

In the last two years, during the COVID-19 pandemic, many countries have experienced a large number of lockdowns, resulting in an increased disconnection of city dwellers from nature. The outcome of this pandemic on touristic customers' preferences certainly requires a significant number of studies in the future. However, we have already learned that when COVID-19 was very prominent, consumers preferred hotels with robot personnel to those with human staff because hygienic issues were in focus. These findings differed from those of previous studies conducted before COVID-19 started [23], which illustrates the adaptive character of preferences that yield dynamic patterns of preferences.

In addition, research has shown that since the COVID-19 outbreak, people have experienced different psychological stressors [47,48]. Based on the ideas that we have discussed above, we would like to state four hypotheses (See Figure 1) that interconnect with each other:

Hypothesis 1. *The burden of COVID-19 influences perceived stress.*

Hypothesis 2. *Perceived stress affects depression.*

Hypothesis 3. *Perceived stress influences preferences for biophilic design.*

Hypothesis 4. *The perceived benefits of nature affect preferences for accommodations with biophilic design.*

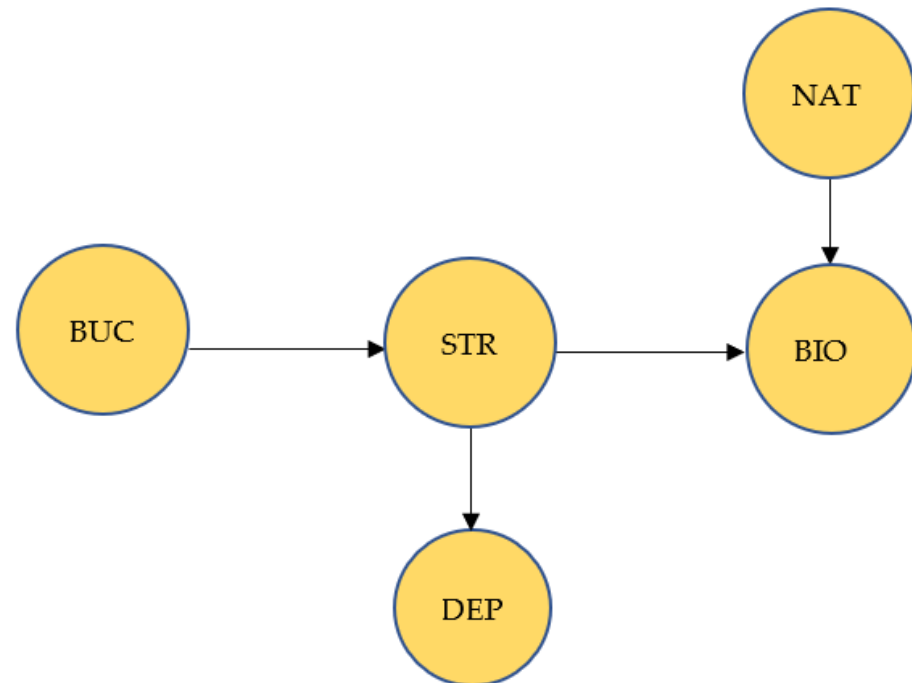


Figure 1. The conceptual framework of the tested model. BUC = burden of COVID-19, STR = perceived stress, DEP = depression, BIO = preferences for biophilic design, NAT = perceived benefits of nature.

4. Methodology

4.1. Measurement Scale

We employed a questionnaire with several sections (Table 1) representing different concepts (including BUC = burden of COVID-19, STR = perceived stress, DEP = depression, BIO = preferences for biophilic design, NAT = perceived benefits of nature). In the following section, we describe these in-depth. The first section of the questionnaire focused on the participants' socioeconomic status. The established scales measured the respondents' stress, level of depression, the burden of COVID-19, preferences for biophilic design attributes, and the perceived benefits of nature. We used Depression, Anxiety, and Stress Scale (DASS-21) to evaluate depression and stress. This assessed the respondents' stress and depression levels throughout the previous week. The respondents chose their answers on a four-point Likert scale to indicate the degree to which each item applied to them. We asked respondents ten questions to calculate the burden of COVID-19. The respondents chose their responses regarding the burden on a seven-point Likert scale to indicate their degree of agreement on each item. We asked the respondents to answer questions about their preferences regarding being or not being visually connected with nature, having access to non-rhythmic sensory stimuli, experiencing thermal and airflow changeability, being exposed to water, dynamic and diffuse light, and being in touch with natural systems to measure their preferences for biophilic design. These items were adapted from Browning et al. [49]. The respondents stated their preferences for any of the attributes of biophilic design in their hotels on a scale from 1 (not at all) to 5 (very much). To measure the perceived benefits of nature, we referred to Dzhambov [50]. The respondents chose their level of agreement with each item on a five-point Likert scale.

Table 1. Measurement constructs and items.

Constructs	Questions
The burden of COVID-19 (BUC)	<p>The current social situation burdens me (BUC1)</p> <p>I feel restricted in my everyday life (BUC2)</p> <p>I am afraid of the current situation (BUC3)</p> <p>I feel socially isolated (BUC4)</p> <p>I'm making the best of the situation (BUC5)</p> <p>I look forward to what will happen (BUC6)</p> <p>I now know better what is important to me (BUC7)</p> <p>My relationships with family and friends have become stronger and better (BUC8)</p> <p>My current situation has some advantages (BUC9)</p> <p>I am worried about my future life (BUC10)</p>
Depression (DEP)	<p>I found it hard to wind down (DEP1)</p> <p>I was aware of the dryness of my mouth (DEP2)</p> <p>I couldn't seem to experience any positive feeling at all (DEP3)</p> <p>I experienced breathing difficulty (DEP4)</p> <p>I found it difficult to work up the initiative to do things (DEP5)</p> <p>I tended to over-react to situations (DEP6)</p> <p>I experienced trembling (DEP7)</p>
Stress (STR)	<p>I felt I was close to panic (STR1)</p> <p>I was unable to become enthusiastic about anything (STR2)</p> <p>I felt I wasn't worth much as a person (STR3)</p> <p>I felt that I was rather touchy (STR4)</p> <p>I was aware of the action of my heart in the absence of physical exertion (STR5)</p> <p>I felt scared without any good reason (STR6)</p> <p>I felt that life was meaningless (STR7)</p>
Biophilic Design (BioPh)	<p>Plants inside and outside (BioPh1)</p> <p>Green roofs (BioPh2)</p> <p>Overlooking tree canopies and the natural landscape (BioPh3)</p> <p>Hearing bird sounds (BioPh4)</p> <p>Appealing weather (BioPh5)</p> <p>Nature scents (BioPh6)</p> <p>Hearing nature sounds (BioPh7)</p> <p>The movement of shadows (BioPh8)</p> <p>The movement of clouds (BioPh9)</p> <p>Proper shade (BioPh10)</p> <p>Radiant heat (BioPh11)</p> <p>Seasonal vegetation (BioPh12)</p> <p>Rivers (BioPh13)</p> <p>Fountains (BioPh14)</p> <p>Water walls (BioPh15)</p> <p>Ponds (BioPh16)</p> <p>Light from different angles (BioPh17)</p> <p>Wildlife habitats (BioPh18)</p>
Perceived benefits of nature (Natu)	<p>Interacting with nature makes me happy (Natu1)</p> <p>Interacting with nature keeps me optimistic (Natu2)</p> <p>Not interacting with nature poorly affects my physical health (Natu3)</p> <p>Visualizing natural scenes makes me happy (Natu4)</p> <p>To maintain physical health, I have to interact with nature (Natu5)</p> <p>I am more positive when I think of nature (Natu6)</p>

Table 1. *Cont.*

Constructs	Questions
	I feel relaxed when I think of nature (Natu7)
	In order not to feel anxious, I have to interact with nature (Natu8)
	I feel uneasy when I am apart from nature for a long time (Natu9)
	I am more capable of gathering my thoughts on the things I need to do when I am close to nature (Natu10)
	Not interacting with nature affects my ability to easily cope with unpleasant thoughts (Natu11)

4.2. Procedure

A large sample of undergraduate and graduate students based on non-probability sampling was collected from August to October 2021. The online questionnaire was created in Google Forms. The link to the questionnaire was distributed among public and private university students in Kerman, Iran. As access to the email address and full list of students was not possible, the academic members of various departments in these universities were initially contacted to help in distributing the questionnaire link among their students. Finally, 507 university students filled out the questionnaire and participated in the study. The calculated response rate of students was 35%. The participants were both undergraduate and graduate students. The reason for selecting students as the target population was due to their various economic backgrounds and ages, which provide an insight into the preferences of people. Initially, the respondents were given an online consent form to complete. They answered questions on perceived stress, depression, the burden of COVID-19, preferences for biophilic design hotels, and the perceived benefits of nature.

5. Data Analysis

5.1. Model Assessment

The proposed measurement model was evaluated via a two-stage technique, which was propagated by Anderson and Gerbig [51]. First, we evaluated the measurement model for each latent variable. We conceived the measurement model as a reflecting measurement model, which allowed us to analyze the reliability, convergent, and discriminant validity of the measurement model. To measure the reliability of the model, we used Cronbach's alpha coefficient with composite reliability (CR) with a cut-off value of 0.70 being considered acceptable [52]. Initially, we evaluated the overall model and identified the constructs with an average variance extracted (AVE) of lower than 0.50. The items with the lowest loadings were eliminated. The items used are shown in bold in Table 2.

Table 2. Reliability and convergent validity for research constructs. BUC = burden of COVID-19, STR = perceived stress, DEP = depression, BIO = preferences for biophilic design, NAT = perceived benefits of nature.

Construct	Items	Loadings	rho_A	CR	CA (Cronbach's α)	AVE
Burden of COVID-19	BUC1	0.762	0.826	0.875	0.821	0.585
	BUC2	0.764				
	BUC3	0.766				
	BUC4	0.856				
	BUC5	0.749				
	BUC6	0.456				
	BUC7	0.526				
	BUC8	0.426				
	BUC9	0.525				
	BUC10	0.766				

Table 2. Cont.

Construct	Items	Loadings	rho_A	CR	CA (Cronbach's α)	AVE
Depression	Depr1	0.692	0.811	0.852	0.795	0.592
	Depr2	0.401				
	Depr3	0.756				
	Depr4	0.738				
	Depr5	0.712				
	Depr6	0.789				
	Depr7	0.892				
Stress	Str1	0.716	0.840	0.875	0.832	0.503
	Str2	0.763				
	Str3	0.783				
	Str4	0.764				
	Str5	0.837				
	Str6	0.740				
	Str7	0.734				
Biophilic design preferences	Bio1	0.495	0.826	0.861	0.820	0.609
	Bio2	0.702				
	Bio3	0.797				
	Bio4	0.402				
	Bio5	0.851				
	Bio6	0.746				
	Bio7	0.546				
	Bio8	0.747				
	Bio9	0.863				
	Bio10	0.595				
	Bio11	0.765				
	Bio12	0.741				
	Bio13	0.432				
	Bio14	0.760				
Perceived benefits of nature	Natu1	0.720	0.937	0.944	0.934	0.607
	Natu2	0.761				
	Natu3	0.749				
	Natu4	0.743				
	Natu5	0.828				
	Natu6	0.744				
	Natu7	0.866				
	Natu8	0.701				
	Natu9	0.861				
	Natu10	0.756				
	Natu11	0.817				

Examining both the CR and Cronbach's alpha in Table 2 shows that they are above the cut-off value of 0.70 [52]. This is the least acceptable internal consistency reliability (mostly much better than just acceptable since the rest of the Cronbach's alpha values exceeded 0.08). The value of the AVE for all the constructs exceeded the cut-off value of 0.50, indicating acceptable convergent validity. Moreover, the outer loading values of all the items of each construct, namely, the burden of COVID-19 (BUC), depression (Dep), stress (STR), preferences for biophilic design (Bio), and the perceived benefits of nature (Natu) were higher than 0.70. The confirmed reliability and convergent validity of the study constructs are shown in Table 2. We examined the discriminant validity of the constructs based on the Fornell–Larcker and Heterotrait–Monotrait (HTMT) criterion. The accepted HTMT value must be less than or equal to 0.85 or 0.90. Table 3 reveals that the discriminant validity was acceptable in the study data. Furthermore, the Fornell and Larcker criterion suggests that the value of the calculated square root of the AVEs for each construct must exceed the correlation values existing between constructs. Moreover, Table 4 demonstrates the discriminant validity while also supporting this criterion.

Table 3. Discriminant validity of modeling based on the Fornell–Larcker criterion.

	BUC	BioPh	DEP	Natu	STR
BUC	0.765				
BioPh	0.272	0.640			
DEP	0.411	−0.114	0.702		
Natu	0.300	0.588	−0.012	0.779	
STR	0.561	−0.051	0.648	0.072	0.709

Table 4. Discriminant validity of modeling based on the Heterotrait–Monotrait ratio (HTMT).

	BUC	BioPh	DEP	Natu	STR
BUC					
BioPh	0.373				
DEP	0.498	0.276			
Natu	0.355	0.638	0.148		
STR	0.660	0.216	0.776	0.182	

5.2. Structural Model Assessment and Multigroup Analysis

To understand if stress, depression, and the perceived benefits of nature influenced preferences for a hotel’s biophilic design and to examine the research hypotheses, we assessed the model using the PIs algorithm. Table 5 presents the data of the path analysis that we conducted to test the hypothesis on direct effects among latent variables. Based on Table 5, the first hypothesis of the study, the effect of the burden of COVID-19 on stress ($\beta = 0.561$, $p < 0.001$), was supported. The second hypothesis also was supported as stress significantly increased depression ($\beta = 0.648$, $p < 0.001$). Stress also was found to increase the preferences for biophilic design attributes ($\beta = 0.093$, $p < 0.017$). Therefore, the third hypothesis was also supported. The direct effect of the perceived benefits of nature on biophilic design preferences was also significant ($\beta = 0.594$, $p < 0.005$); accordingly, Hypothesis 4 was also accepted.

Table 5. Path analysis was used to test the hypothesis of direct effects.

Hypothesis	Path Coefficient β	t-Value	p-Value	25%	97.5%	VIF	f^2	Supported
H1 Burden of COVID-19 → Stress	0.561	20.958	0.001	0.511	0.513	2.314	0.457	Yes
H2 Stress → Depression	0.648	19.076	0.001	0.579	0.609	5.559	0.501	Yes
H3 Stress → Biophilic preferences	0.093	10.971	0.017	0.235	0.307	3.771	0.124	Yes
H4 Perceived benefits of nature → Biophilic Preferences	0.594	14.051	0.005	0.540	0.554	2.660	0.307	Yes

The effect size (f^2) estimates the extent to which an IV affects DV. As is suggested by Chin [53] 0.02, 0.15, and 0.35 show small, moderate, and significant effect sizes, respectively. According to Table 5, the f^2 for the effect of the burden of COVID-19 on stress (0.020), stress on depression (0.007), stress on biophilic design preferences (0.006), and the perceived benefits of nature on biophilic design preferences were considered significant (0.007). Multicollinearity among the variables was evaluated, taking into account the variance inflation factor (VIF) value. It is suggested that a VIF that exceeds 10 indicates a potential issue with multicollinearity [54]. Based on Table 5, the calculated VIF for all of the variables was below the threshold of 10.

6. Discussion and Conclusions

Human attachment to nature can be traced to many years ago. This attachment is reflected in preferences for organic building designs, materials, and shapes; nature-inspired places; and traditional life in the vicinity of nature. A common theme in the review of published articles on biophilic designs shows that people have been detached from nature

because of the modern approach employed in designing buildings [21]. In the last few years, there has been great concern about the positive impacts of biophilic design on people's life [55,56]. Most of these studies rely on the restorative role of nature and its effect on human beings' well-being and mental health [57]. Accordingly, through biophilic design, architects attempt to connect people with nature using different strategies.

The United Nations World Tourism Organization (UWTO) has declared 2020 as being the worst year in tourism history because of the COVID-19 pandemic [1,2]. Destinations, travelers, local governments, stakeholders, and citizens, as well as their daily activities, were all impacted [4,8,17]. With a long and challenging experience of lockdowns, accompanied by stress and fear of disease, the current study attempted to examine peoples' preferences for hotel attributes during the post-COVID-19 era. It attempted to examine whether the burden of COVID-19, stress, and belief in the healing power of nature affect peoples' preferences for hotels with biophilic attributes. Our findings suggest that the burden of COVID-19 increased the stress level of the respondents, which consequently increased the chance of depression. The result of this study hence supports the result of the research conducted by Brailovskaia and Margraf [58]. The finding is also in line with studies that concentrate on peoples' increased stress due to the COVID-19 pandemic [41]. Thus, perceived stress during the COVID-19 pandemic is an important factor that cannot be overlooked.

The study further found that perceived stress and the benefits of connection to nature significantly affect tourists' preferences for exposure to nature and hotels with biophilic attributes. Our study suggests that the demand for biophilic buildings will increase during the post-COVID-19 era. These findings hence support the studies on the perceived effect of nature on stress reduction and well-being [27,38]. The findings further canonize the importance of exposure to nature from the tourists' point of view.

The finding of the study is unique and valuable from various perspectives. First of all, the current research is one of the first studies that has examined tourists' accommodation preferences during the post-COVID-19 era. The study targeted Iran as one of the countries with the longest lockdowns and many travel cancellations since the appearance of COVID-19. Accordingly, the result of the current study can provide important information for architects and tourism managers. Thirdly, with the rise of ever new variants of CoV-SARS2 during the COVID-19 epidemic, we do not know for sure when the tourism industry will return to normal. At the beginning of 2022, the uncertainty about the severity of the disease caused the cancellation of a large number of flights and the closing of hotels and accommodations around the world. A large number of people celebrated their new year away from crowds and within their families. The year 2022 might bring more lockdowns, stress, and depression. Accordingly, the need for connection with nature will be felt more than ever.

As the findings of the current study shed light on the importance of accommodations with biophilic design, various possible design strategies might be taken into account by architects and hotel managers. To satisfy people's needs for a connection with nature, the location of hotels can be an important factor. Hotels that are located in natural settings might provide easier access to appealing weather, overlooking tree canopies and the natural landscape, and provide the opportunity to hear nature and bird sounds. If this is not possible, the architects need to add natural qualities to the design of the building. Adding plants in the indoor spaces of hotels and a surrounding landscape creation of green roofs, water walls, and fountains in the interior spaces hotels can at least partially satisfy the needs for biophilic design.

Limitations and Future Research

There are some limitations involved in the current study. First of all, we did not have access to the full list of respondents and their email addresses. Accordingly, our non-probability sampling limits the possibility of generalization of the findings. In addition, while this study attempts to scrutinize tourists' preferences in the post-COVID-19 era, due

to the unknown nature of this pandemic, further studies with different target groups can provide a better understanding of the subject.

7. Patents

There are no patents resulting from the work reported in this manuscript.

Author Contributions: All of the authors contributed to the writing and completion of the research. F.K. mostly focused on data analysis and research methodology. M.H.N. was mostly involved with the data collection. C.C.C. worked on the manuscript. M.J.K. contributed to writing and reviewing the paper. She acquired funding for the research as well. All authors have read and agreed to the published version of the manuscript.

Funding: This work was supported by the National Research Foundation of Korea(NRF) grant funded by the Korea government(MSIT) (No. NRF-2019R1A2C1087344).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The raw data supporting the conclusions of this article will be made available by the authors without undue reservation.

Conflicts of Interest: The authors declare no conflict of interest.

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