

Nature's Resurgence: Reimagining Society's Perception of Forest Resources Amidst the COVID-19 Pandemic (A Case Study of Türkiye)

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Abstract

Aim of study: To investigate how the COVID-19 pandemic influenced society's perception and utilization of forests and forest resources in Bartın province, Türkiye.

Area of study: Bartın province, located in northern Türkiye, characterized by significant forest coverage.

Material and method: A questionnaire survey was administered to 400 participants, focusing on forest visitation habits, consumption of non-wood forest products, and forestry-related activities during the pandemic.

Main results: The pandemic led to:

- Increased public desire to visit forest parks,
- Heightened demand for non-wood forest products (especially herbal teas),
- Decreased participation in forestry-related work traditionally supporting household income.

Research highlights: Forests emerged as vital refuges providing both physical and psychological benefits during crises. Findings emphasize the necessity of proactive forest management and policies that recognize forests' ecological, social, and health functions beyond economic value.

Keywords: COVID-19, Forest Resources, Recreation, Türkiye

Doğanın Yeniden Canlanması: COVID-19 Pandemisinde Orman Kaynaklarına Yönelik Toplumsal Algının Yeniden Kurgulanması (Türkiye Örneği)

Öz

Çalışmanın amacı: COVID-19 pandemisinin toplumun ormanlara ve orman kaynaklarına yönelik algı ve kullanımına etkilerini Bartın ili örneğinde incelemektir.

Çalışma alanı: Yoğun orman varlığına sahip Türkiye'nin kuzeyinde yer alan Bartın ili.

Materyal ve yöntem: Pandemi sürecinde 400 katılımcıya uygulanan anket ile orman ziyaret alışkanlıkları, odun dışı ürün tüketimi ve ormancılık faaliyetlerine katılım değerlendirilmiştir.

Temel sonuçlar: Pandemi ile birlikte:

- Orman parklarını ziyaret etme isteği artmış,
- Odun dışı orman ürünlerine (özellikle bitki çayları) talep yükselmiş,
- Hane gelirine katkı sağlayan ormancılık faaliyetlerine katılım azalmıştır.

Araştırma vurguları: Ormanlar kriz dönemlerinde hem fiziksel hem psikolojik açıdan önemli bir sığınak işlevi görmüştür. Bulgular, ormanların ekonomik değerlerinin ötesinde sağlık ve refaha katkılarının dikkate alınacağı yeni ormancılık politikaları ve yönetim stratejilerinin gerekliliğini ortaya koymaktadır.

Anahtar kelimeler: Covid 19, Orman Kaynakları, Rekreasyon, Türkiye



Introduction

Influenza pandemics are not new to the world (Saunders-Hastings & Krewski, 2016). They have occurred roughly three times each century since the 1500s. The 20th century saw three such pandemics: the "Spanish flu" (1918-1919), "Asian flu" (1957-1958), and "Hong Kong flu" (1968-1969) (Qiu et al., 2017). In 2020, the COVID-19 virus, originating in Wuhan, China, was declared a pandemic by the World Health Organization (WHO) on March 11, 2020 (URL-1, 2020). This declaration led to global disruptions, including travel restrictions, suspended education, and a shift to online interactions. The pandemic's widespread impact, amplified by social media, caused significant stress and anxiety (Hou et al., 2020). Studies have linked COVID-19 to mental health issues like depression, anxiety, and insomnia, primarily due to psychosocial stressors (Mahmud et al., 2023). The pandemic and resulting confinement measures presented a novel situation, creating emotional distress and social challenges (Cullen et al., 2020; Pfefferbaum & North, 2020). In response to WHO recommendations, preventive measures like mask-wearing, hygiene practices, and social distancing were adopted. COVID-19 affected various aspects of life, including healthcare, economics, and social interactions (Haleem et al., 2020). The pandemic had both positive and negative environmental consequences. Increased medical waste was a drawback (Saadat et al., 2020), while reduced CO₂ emissions due to lockdowns offered a positive outcome (Dantas et al., 2020; Le Quéré et al., 2020).

Experts have confirmed that exposure to nature and green spaces not only protects against the negative consequences of quarantine during the pandemic but also provides positive benefits for physical and mental health (Slater et al., 2020). Forests, in addition to being a source of wood, offer numerous benefits to society, notably their use as recreational areas. People living in crowded cities particularly need green spaces to escape the stresses of work, traffic, and daily life. This need is amplified during times of crisis like the pandemic. Studies have shown that even brief exposure to nature

through green exercise improves mental health and self-esteem, regardless of duration, location, gender, age, or health status (Barton & Pretty, 2010). However, the pandemic led to the closure of parks and green spaces in many countries, limiting physical activity and disproportionately affecting vulnerable individuals (Spano et al., 2021). The health benefits of urban green spaces are particularly crucial for city dwellers during pandemics like COVID-19 (Lopez et al., 2021; Garrido-Cumbrera et al., 2022). Ensuring fully functional urban green spaces, even during pandemics, where people can safely isolate, rest, and relax in nature, is key to improving the well-being of urban residents post-COVID-19 (Olszewska-Guizzo et al., 2021).

COVID-19, a respiratory disease-causing shortness of breath (Ciotti et al., 2020), increases the need for clean oxygen. Urban areas, with their high population densities, are at greater risk for virus transmission (Saadat et al., 2020), making access to green spaces even more critical for city dwellers. Ironically, studies show that urban residents reduced their recreational activities more than rural residents during the pandemic (Rice et al., 2020). Given that rapid urbanization is occurring worldwide, with an estimated 68% of the world's population expected to live in urban areas by 2050 (Marzouk & Othman, 2020), access to green areas and forest parks is becoming increasingly vital, especially for those living in cities.

Humans have evolved from living in tree hollows and hunting and gathering in forests to settling and cultivating land (Günay, 2003). Today, forest resource use is governed by forestry laws. Coşkun (1999) emphasized the need for control and clear limits on forest use to prevent destruction. Türker (2011) highlighted the intensive use of non-wood forest products in Turkey under current legal regulations. Forests offer a wide range of benefits, from wood production and oxygen generation to clean water and diverse non-wood products. The recent pandemic has shifted preferences towards outdoor activities, fresh air, herbal teas, and non-wood forest products. This research hypothesizes that the pandemic, with its confinement and challenging conditions, has increased the need

for forest resources. A questionnaire has been designed to test this hypothesis. If confirmed, the study aims to identify specific needs and propose measures to meet them, thus increasing the study's broader impact.

Material and Methods

Considering that the public's need for forest resources and recreation areas has changed during the pandemic period, an original survey was prepared in accordance with the purpose of the research. In addition to general demographic information, the questionnaire comprises multiple-choice questions and queries to be assessed using a five-point Likert scale. In this way, the evaluation of the data obtained will be more objective, easy, and comparable.

Bartın province of Türkiye was selected as the study area. According to the official statistics of the General Directorate of Forestry (GDF), the total forest area of Bartın province is 135437 ha. and the ratio of forest area to the general area is 59%. Since Bartın province, which has a rich biodiversity in terms of forest areas and flora and fauna, constitutes a limited society, according to the formula used (Eq. 1) in the calculation of "sample size in limited societies" (Daşdemir, 2016), it was calculated that if at least how many people were surveyed, the results would be representative of the society.

$$n \geq \frac{Z^2 \times N \times p \times q}{(N \times D^2) + (Z^2 \times p \times q)} \quad (1)$$

The formula used the following:

n: Sample size (minimum number of respondents).

N: Population size (207238 according to 2023 TUIK data).

Z: Confidence coefficient (1.96 for 95% confidence level).

D: Accepted sampling error rate (5%).

p: Likelihood of the investigated event (0.5).

q: Unlikelihood of the investigated event (0.5).

According to this formula, the sample size was calculated as 383 people. This means that a survey conducted with at least 383 participants would statistically represent the population, avoiding unnecessary expenditure of effort, time, and resources. To account for potentially incomplete or incorrectly filled questionnaires, the sample size was set at 400. Participants were selected using a random sampling method, and the questionnaire was conducted in Bartın city center, as well as in outdoor recreational areas, urban forests, and nature parks. Participation was voluntary, with respondents provided the necessary information in advance.

After the obtained questionnaire answers were digitized, they were compared with percentage and frequency analysis, and the relationship between variables was evaluated with Correlation Analysis. For this, excel and spss programs were used. Descriptions and codes given in Table 1 were used to evaluate the questionnaire questions and answers.

Table 1. Defining the research variables

Code	Name	Description
EDU	Education level	1: uneducated, 2: primary school, 3: middle school, 4: high school, 5: associate degree, 6: undergraduate 7: postgraduate
GEN	Gender	1: female, 2: male
AGE	Age	1: 18–30 age range; 2: 31–50 age range; 3: 51–65 age range; 4: 65 over 65 years
INSOU	Income Source	1: public employee, 2: Private, 3: retired, 4: Student, 5: unemployed
PPVF	Pre-pandemic visit frequency	1: Never, 2: Rarely, 3: Usually, 4: Frequently, 5: Quite Often
IPFU	Impact of the pandemic on forest utilization	1: Yes, 2: Little, 3: No
EUUF	Efficient use of forests resources	1: Strongly Disagree, 2: Disagree, 3: Neutral, 4: Agree, 5: Strongly Agree
NFC	Necessity of forests in city	1: Strongly Disagree, 2: Disagree, 3: Neutral, 4: Agree, 5: Strongly Agree

Table 1 (Continued)

Code	Name	Description
INFP	Increased need for forest resources in pandemic	1: Strongly Disagree, 2: Disagree, 3: Neutral, 4: Agree, 5: Strongly Agree
ARAN	Adequacy of recreation areas to needs	1: Strongly Disagree, 2: Disagree, 3: Neutral, 4: Agree, 5: Strongly Agree
FURP	Frequency of using recreation areas in pandemic	1: Strongly Disagree, 2: Disagree, 3: Neutral, 4: Agree, 5: Strongly Agree
IPLCF	Increased preference for less crowded forest areas in pandemic	1: Strongly Disagree, 2: Disagree, 3: Neutral, 4: Agree, 5: Strongly Agree
ICHT	Increase in consumption of herbal teas	1: Strongly Disagree, 2: Disagree, 3: Neutral, 4: Agree, 5: Strongly Agree
IPFW	Increase in preference for forest walks in pandemic	1: Strongly Disagree, 2: Disagree, 3: Neutral, 4: Agree, 5: Strongly Agree
EFPH	Positive effects of forests on public health in pandemic	1: Strongly Disagree, 2: Disagree, 3: Neutral, 4: Agree, 5: Strongly Agree
IIGF	Increased income generation from forests in pandemic	1: Strongly Disagree, 2: Disagree, 3: Neutral, 4: Agree, 5: Strongly Agree

Finding and Results

The study focused on Bartın province, which boasts a substantial forest area of 135437 hectares, constituting 59% of its total area. Renowned for its rich biodiversity in

forests, flora, and fauna (Figure 1), Bartın was chosen due to its city center's proximity to forest areas, making it ideal for evaluating public perception of forests and resources during the COVID- 19 pandemic.

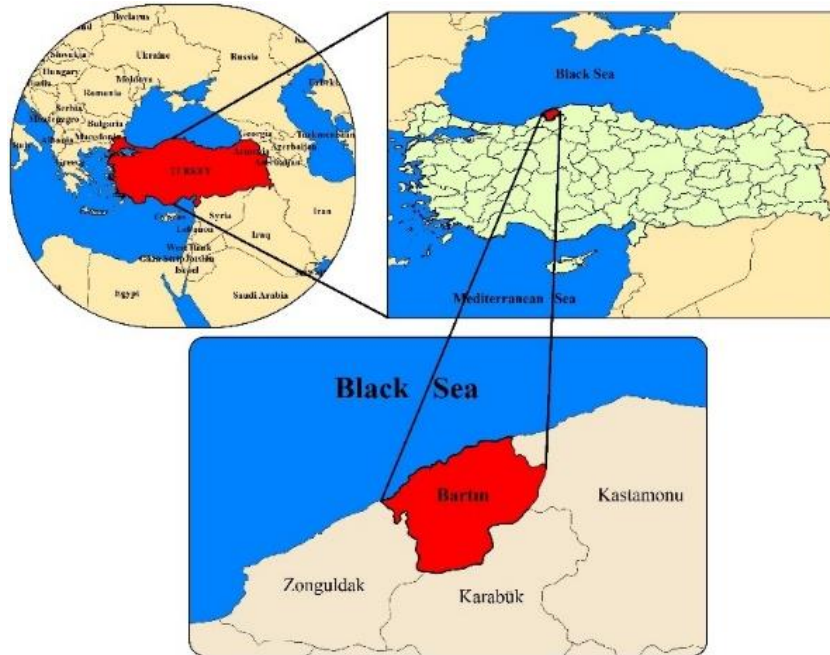


Figure 1. Study Area Bartın Province

The pandemic drastically altered daily life in the country. Schools closed, most people remained indoors to curb the spread of the virus, and those who worked took strict precautions. Administrative fines were even levied on those who flouted the restrictions.

As conditions eased, the need for fresh air and time spent in nature parks and less crowded forest areas grew for a population that had been largely confined to their homes. Table 2 presents the general information results from the public questionnaire of 400 respondents.

Table 2. Demographic information of questionnaire participants

General information			
	Valid	Frequency	Percent
Gender	Famale	118	29.5
	Male	282	70.5
	Uneducated	9	2.3
Education level	Primary school	41	10.3
	Middle school	41	10.3
	High school	92	23.0
	Associate degree	51	12.8
	Undergraduate	144	36.0
Age	Postgraduate	22	5.5
	18-30	165	41.3
	31-50	191	47.8
	51-60	41	10.3
	65üstü	3	0.8
	Public employee	114	28.5
Income Source	Private	157	39.3
	Retired	32	8.0
	Unemployed	30	7.5
	Student	67	16.8

Upon analyzing the initial survey results, it's evident that most participants were male. This likely stems from the timing of the survey, which coincided with lingering pandemic restrictions, a period when women tended to go out less and were less inclined to participate.

Regarding education levels, most participants were either undergraduate or high school graduates, indicating a well-educated sample. The age distribution was representative of various age groups in society, with the exception of those over 65. The low participation of older individuals is attributed to pandemic-related restrictions and their reluctance to engage in face-to-face interactions. Similarly, students and retirees were underrepresented due to the aforementioned reasons.

When asked about their perception of forests, the majority of respondents associated forests with "Trees and greenery" followed by "Fresh air" and "Recreational area" (Table 3). This highlights the strong visual connection between forests and trees, emphasizing the positive aesthetic appeal of green spaces.

Furthermore, when questioned about benefiting from forests, 52% of respondents answered "Yes" while 47% said "Somewhat". These results demonstrate a general awareness of the benefits forests provide.

Considering that approximately 60% of Bartın province is covered in forests, this positive perception is expected. This is further supported by the following question, where 90% of respondents deemed the forest area in Bartın as either excessive or sufficient.

Table 3. The meaning and benefits of forest

Valid	Frequency	Percent
Trees and greenery	309	77.25
Fresh air	29	7.25
Recreation area	40	10
Wood material	9	2.25
Wildlife	8	2
NWFP	4	1

Participants were then asked about their frequency of visits to forest recreation areas before the pandemic (Table 4). Responses indicated a high rate of utilization. When asked whether the pandemic negatively affected their utilization level, 40% answered "Yes" 49% answered "Somewhat" and only 11% reported no impact. These results suggest that residents in the sample area frequently used recreation areas before the pandemic, and the pandemic significantly reduced this frequency.

Table 4. The frequency of visiting forest recreation areas before the pandemic

Valid	Frequency	Percent
Very often	73	18.3
Often	93	23.3
Usually	135	33.8
Rarely	94	23.5
Never	5	1.3

To determine which forest resource utilization levels increased during the pandemic, a multiple-choice question was presented to the participants. As they could choose multiple options, the frequency ratios in Table 5 represent the preference percentage for each option. Upon evaluating Table 5, it's evident that residents in the sample area predominantly increased their use of forest areas for picnicking, camping, sports, and recreation. This was followed by a preference for the fresh air and psychological benefits of natural beauty. This aligns with the fact that the pandemic forced people indoors, restricted movement, and limited social interaction,

thereby increasing the need for outdoor activities and mental well-being. Conversely, the least preferred utilization options were “opportunity to work in the forestry sector”

and “grazing with permission” indicating that the pandemic did not significantly impact the demand for these activities.

Table 5. Increased forest utilization needs during the pandemic

Options	%
Picnicking, camping, sports, or relaxation in the forest	83
Benefiting from its fresh air	66
Relaxing psychology with its natural beauty	58
Non-wood forest products (chestnuts, mushrooms, linden, thyme, etc.)	31
Need for firewood and woodwork	23
Clean drinking water sources in the forest	17
Licensed hunting in the forest	9
Grazing animals with permission in forest pastures	4
Employment opportunities in the forestry sector	4
Other	0.3

The questionnaire results revealed a significant increase in the desire to use forest areas for recreation during the pandemic. Additionally, the demand for specific non-wood forest products (NWFPs) also rose. Respondents were allowed to select multiple

options, and the results showed a notable increase in the demand for herbal teas like linden, sage, and laurel (Table 6). Furthermore, there was a heightened interest in immune-boosting products such as honey, pollen, and propolis.

Table 6. Increased NWFP needs during the pandemic

Options	%
Herbal teas such as linden, sage, laurel	78
Immune-boosting products like honey, pollen, propolis	59
Pinecone syrup	15
Essential oils (thyme, mint, lavender, etc.)	12
Elderberry and other plant extracts	5
Other	6

Finally, respondents were asked to provide Likert scale evaluations. Table 7 reveals that the majority (38.5% “Agree” and 7.5% “Strongly Agree”) believe that forest resources are efficiently utilized in Turkey. This may be attributed to the fact that 99.9% of Turkish forests are state-owned and their utilization is strictly regulated. Various permits and fees are required for activities like collecting non-wood forest products or accessing recreation areas. Wood production and sales are also managed by state forest enterprises through open tenders. While forests offer numerous quantifiable and immeasurable benefits, some benefits, like enjoying natural beauty and fresh air, cannot

be easily monetized. Therefore, it is not surprising that forests are considered an indispensable part of urban life (86.3% “Strongly Agree”). The survey region's abundance of forest areas, coupled with the public's high level of awareness and utilization, is seen as a positive outcome. However, there were mixed responses regarding the satisfaction of community needs in recreation areas within Bartın province. This may be due to insufficient capacity in forest parks and city parks (24.8% “Disagree” 39.8% “Neutral” 27% “Agree”). This indicates a potential area for improvement in the management and development of recreational facilities within the region.

Table 7. Society's Perspective on Forest Resources Before and After the Pandemic

Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
EUF: Do you think forest resources are utilized efficiently?	3.5	18.3	32.3	38.5	7.5
NFC: Are forests an important element of urban life?	--	--	2.3	11.5	86.3
INFP: Did you need forest resources more during the Covid-19 pandemic?	--	2.8	23.3	55.5	18.5
ARAN: Are the recreational areas in Bartın province adequate to meet the needs of the society?	1.8	24.8	39.8	27.0	6.8
FURP: Has your frequency of visiting urban forests and recreation areas changed during the pandemic?	0.5	10.0	28.8	56.8	4.0
IPLCF: Did you prefer urban forests and recreation areas to avoid crowds during the pandemic?	0.3	3.3	25.3	61.8	9.5
IPFW: Did you prefer forest walks to get plenty of fresh oxygen during the pandemic?	--	4.8	24.3	60.0	11.0
ICHT: Did you increase your consumption of herbal teas during the pandemic?	0.5	12.3	22.3	55.5	9.5
EFPH: Do you think that forests positively impact public health during the pandemic?	--	1.3	8.5	24.8	65.5
IIGF: During the pandemic, has your participation rate increased in production activities that will generate income for your household from forests?	30.0	33.3	17.5	16.8	2.5

Evaluation of responses to the remaining questionnaire questions reveals an increased need for forest resources during the COVID-19 pandemic (55.5% Agree, 18.5% Strongly Agree), accompanied by a change in the frequency of visiting recreation areas (56.8% Agree, 4% Strongly Agree). Respondents expressed a preference for forest resting places to avoid crowded areas (61.8% Agree, 9.5% Strongly Agree), opting for walks in forests with abundant fresh air (60% Agree, 11% Strongly Agree), and reported increased consumption of immune-boosting herbal teas (55.5% Agree, 9.5% Strongly Agree). These responses collectively indicate a clear rise in the need for forests and their resources during the pandemic, particularly for walks, herbal teas, immune-boosting products, and recreational activities.

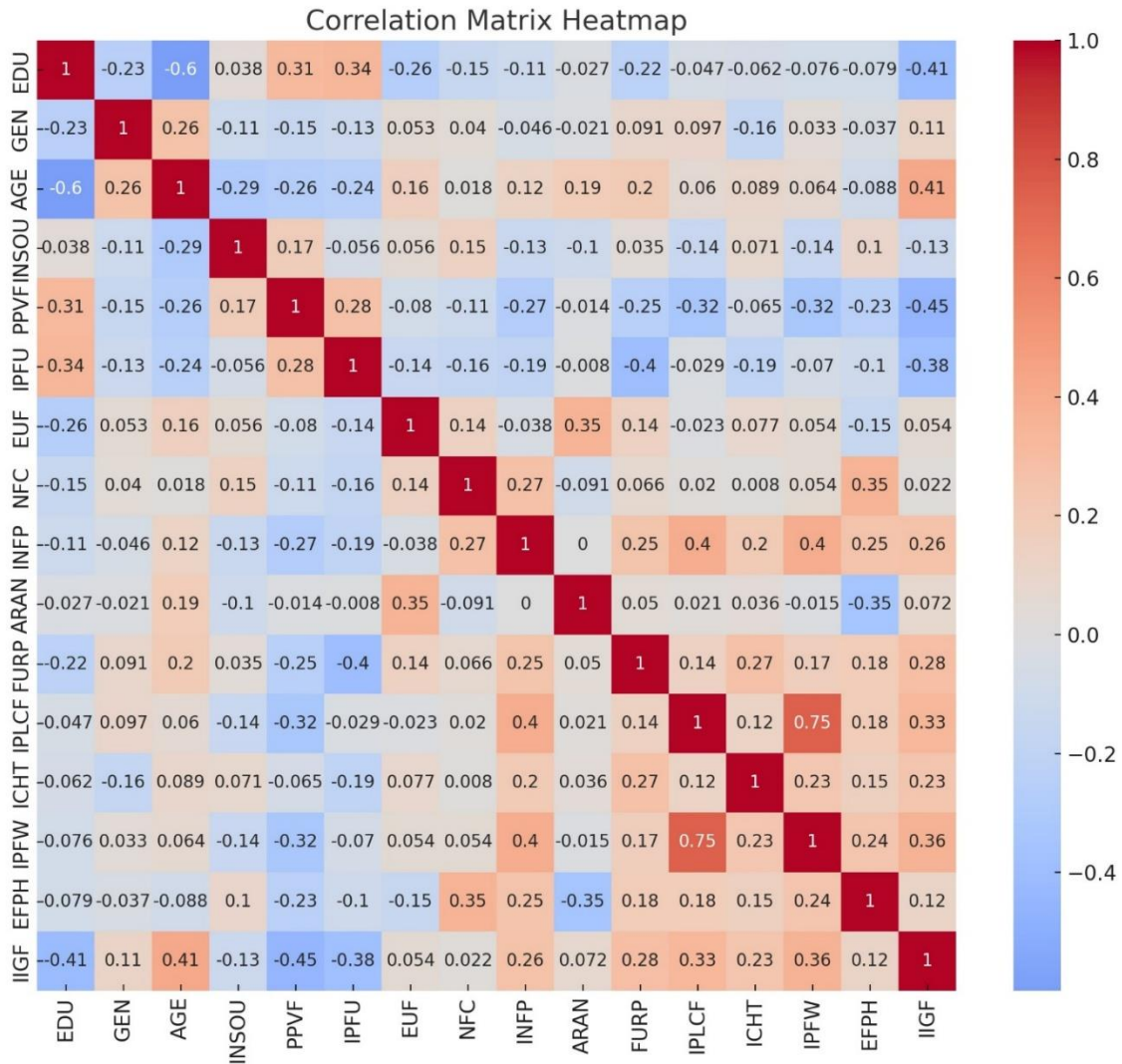
The survey also highlights the positive impact of forests on public health during the pandemic, with a strong agreement from respondents (24.8% Agree, 65.5% Strongly

Agree). However, when asked about participating in income-generating forest activities during the pandemic, a high percentage reported no involvement (30% Strongly Disagree, 33.3% Disagree). This suggests that while people need forest resources, they haven't engaged in or profited from forest-related work. The survey results underscore the importance of forest parks and green areas as places of refuge and well-being during challenging times like the pandemic. Furthermore, they highlight the increased demand for immune-boosting products like herbal teas, which are derived from forests.

Correlation Analysis

Correlation analysis (Table 8) was conducted r to see if there was any relationship between the variables created by the questionnaire's questions and the responses and to determine its direction and strength, if any.

Table 8. Correlation analysis



The correlation matrix, visualized through a heatmap, reveals significant relationships between several variables. Education (EDU) and Age (AGE) (Correlation Coefficient: -0.599): There is a strong negative correlation between education level and age. This suggests that as age increases, education levels tend to decrease. Based on the analysis of the provided data, a robust and positive correlation has been identified between age and the perception that forest areas are utilized efficiently. Furthermore, a robust and affirmative correlation has been ascertained between age and the perception of adequacy regarding urban recreation areas. Similarly, a robust and positive correlation was observed between age and individuals with an increased demand for recreational areas during the

pandemic period. This scenario can be interpreted as indicating that older age cohorts exhibit a heightened inclination towards visiting both forest park and green area within urban settings. According to the table, there were no significant differences between the answers given by the respondents in terms of gender.

Discussion and Conclusion

For centuries, forests have been utilized in diverse ways globally and within Turkey. Although utilization patterns and awareness levels vary across cultures and lifestyles, shared benefits are recognized. Research has shown that non-wood benefits, such as recreation and environmental services, are often prioritized over wood benefits in forest

resource management (Öztürk & Türker, 2005). However, a study in Çankırı city center revealed a limited social perception of forests, highlighting the need for public education on the multifaceted values of forests beyond their recreational uses (Birben et al., 2018).

People have long valued the physical and psychological benefits of forests, including their tranquil atmosphere, scenic beauty, mild climate, clean air, and overall environment. Studies have shown that phytoncides, released from trees, contribute to reducing stress hormone production (Li, 2010). A study involving a three-day "Shinrin-yoku" (forest bathing) trip demonstrated positive effects on mood, blood pressure, heart rate, and oxygen saturation levels in male university students (Lyu et al., 2019).

Our study in Bartın province, where forests cover approximately 60% of the land, reveals a significant demand for forest resources among the local community. The forest park near the city is especially popular, receiving frequent visits. This demand notably intensified during the COVID-19 pandemic, with people seeking quieter, more peaceful, and less crowded forest areas to avoid infection and large gatherings. However, precautionary measures implemented during the pandemic, such as stay-at-home orders and associated fines for non-compliance, initially limited access to urban forests, forest parks, and other recreational areas.

Despite initial adherence to regulations in Turkey, as weather conditions improved and the infection rate decreased, individuals began to venture back into outdoor spaces and forest parks. This was particularly evident among those who had experienced extended periods of confinement, severe illness, the loss of loved ones, or respiratory difficulties. These individuals sought solace in forest parks, valuing the fresh air and less crowded environments (Table 5).

Similar findings were observed in a study conducted in Artvin, Turkey, which explored the expectations of urban forest users through a questionnaire. The research revealed that people primarily sought benefits related to open air, emotional well-being, scenic beauty, nature appreciation, and environmental awareness. The urban forest's unique

landscape and natural resources were identified as key attractions (İnanç, 2019).

Another study in Kahramanmaraş city center investigated the adequacy of green spaces and public expectations. The research concluded that urban and peri-urban green spaces positively impact the quality of urban life, foster urban identity, and contribute to the city's image (Sandal & Karademir, 2013). These findings collectively underscore the importance of green spaces for public health and well-being, especially during challenging times like the pandemic.

Furthermore, the research findings indicate a heightened demand for non-wood forest products during the pandemic. Notably, forest by-products such as herbal tea, honey, and propolis were preferred to bolster immunity against diseases like COVID-19 or alleviate its symptoms (Table 6). This aligns with a study highlighting the significant positive effects of combining herbal medicines with Western medicine in treating COVID-19 (Ang et al., 2020).

Our research also reveals that urban dwellers, in particular, displayed an increased desire to visit forest parks during the pandemic, seeking solace in less crowded spaces. This corroborates other COVID-19 studies demonstrating the positive impact of visiting natural areas on coping with pandemic-related psychological stress (Weinbrenner et al., 2021). For instance, one study linked nature therapy to improved mental health and a decrease in COVID-19 cases, even in areas with limited green spaces (Rajoo et al., 2021). In summary, individuals in greener environments tend to exhibit fewer symptoms and report higher levels of overall well-being (De Vries et al., 2003).

Our research also found no gender-based differences in visiting forest parks or utilizing forest resources. However, a Swedish study conducted among residents near green spaces found that women were more active in urban green areas and perceived greater aesthetic value (Sang et al., 2016). This discrepancy may be attributed to the traditional Turkish family structure, where gender distinctions are minimized in activities like visiting green areas, picnicking, or utilizing the forest, as

these are often undertaken collectively as a family.

The study indicates a heightened need for green spaces during and after the pandemic in the sample area, emphasizing the importance of developing and maintaining these spaces to meet societal demands. This finding aligns with a study conducted across 20 European countries, which revealed a positive shift in social awareness regarding nature-related issues during the pandemic (Rousseau & Deschacht, 2020).

To gauge the belief in forests' positive impact on mental health and stress reduction, participants were asked about the therapeutic effects of natural beauty on their psychology, with the majority (65%) affirming this notion. This mirrors a Spanish study showing that individuals who frequented green spaces during the pandemic managed stress levels better and exhibited an increased appreciation for these areas (Maury-Mora et al., 2022). The pandemic also triggered significant migration from densely populated urban areas to rural areas globally (Saxena et al., 2021). A Spanish study revealed that affluent families, particularly those with second homes near city centers, relocated to less populated areas during this period (González-Leonardo et al., 2022). Bartın province, a tranquil coastal city in Turkey, experienced a 4.6% population increase from 198000 in 2019 to 207000 in 2023 (URL-2), surpassing pre-pandemic growth rates.

In this study, research and questionnaire were conducted on the hypothesis that society needs forest resources and green areas more during the Covid-19 period. According to questionnaire results and similar studies, society's demand for green areas and non-wood forest products has increased during pandemics and similar situations. With the anticipation of averting future pandemics and mitigating losses, it is essential for forest administrations to proactively strategize and ensure readiness in fulfilling the perpetual demand for green areas and forest resources within society. In light of the perennial requirement for the physical and psychological sustenance offered by green areas, the responsibility to address the escalating demand during such intervals rests

upon the domain of forestry policy and management. Hence, it is of paramount importance to formulate forestry policies with due regard to these realities.

The limitations of this study include the fact that the surveys were conducted within the boundaries of Bartın province, and participants were selected from specific demographic groups. Future research could involve comparative studies with surveys conducted in different regions, as well as an increase in sample size. Additionally, increasing the sample size could enhance the generalizability of the research findings.

Ethics Committee Approval

N/A

Peer-review

Externally peer-reviewed.

Author Contributions

Conceptualization: G.G.; Investigation: M.Ç.; Material and Methodology: G.G., M.Ç.; Visualization: G.G., M.Ç.; Writing-Original Draft: G.G.; Writing-review & Editing: G.G., M.Ç. All authors have read and agreed to the published version of the manuscript.

Conflict of Interest

The authors declare that they have no conflict of interest.

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References

- Ang, L., Song, E., Lee, H. W. & Lee, M. S. (2020). Herbal medicine for the treatment of coronavirus disease 2019 (COVID-19): a systematic review and meta-analysis of randomized controlled trials. *Journal of Clinical Medicine*, 9(5), 1583.
- Barton, J. & Pretty, J. (2010). What is the best dose of nature and green exercise for improving mental health? A multi-study analysis.

- Environmental Science & Technology*, 44(10), 3947-3955.
- Birben, Ü., Ünal, H. E. & Karaca, A. (2018). Orman kaynaklarına ilişkin toplumsal algının incelenmesi (Çankırı kent merkezi örneği). *Turkish Journal of Forestry*, 19(1), 76-82.
- Ciotti, M., Ciccozzi, M., Terrinoni, A., Jiang, W. C., Wang, C. B., et al. (2020). The COVID-19 pandemic. *Critical Reviews in Clinical Laboratory Sciences*, 57(6), 365-388.
- Çoşkun, A. A. (1999). Türkiye’de ormanlardan yararlanmanın yasal esasları. *Journal of the Faculty of Forestry, Istanbul University*, 49(1), 83-110.
- Cullen, W., Gulati, G. & Kelly, B. D. (2020). Mental health in the COVID-19 pandemic. *QJM: An International Journal of Medicine*, 113(5), 311-312.
- Dantas, G., Siciliano, B., França, B. B., da Silva, C. M. & Arbilla, G. (2020). The impact of COVID-19 partial lockdown on the air quality of the city of Rio de Janeiro, Brazil. *Science of the Total Environment*, 729, 139085.
- Daşdemir, İ., 2016. *Bilimsel Araştırma Yöntemleri*. Nobel Yayınevi (Yayın No: 1536, 210 syf. ISBN 978-605-320-442-8).
- De Vries, S., Verheij, R. A., Groenewegen, P. P. & Spreeuwenberg, P. (2003). Natural environments-healthy environments? An exploratory analysis of the relationship between greenspace and health. *Environment and Planning A*, 35(10), 1717-1731.
- Garrido-Cumbrera, M., Foley, R., Correa-Fernández, J., González-Marín, A., Braçe, O., et al. (2022). The importance for wellbeing of having views of nature from and in the home during the COVID-19 pandemic. Results from the Green COVID study. *Journal of Environmental Psychology*, 83, 101864.
- González-Leonardo, M., Rowe, F. & Fresolone-Caparrós, A. (2022). Rural revival? The rise in internal migration to rural areas during the COVID-19 pandemic. Who moved and Where?. *Journal of Rural Studies*, 96, 332-342.
- Günay, T. (2003). Ormancılığımızın Tarihçesine Kısa Bir Bakış. Tarım ORKAM-SEN yayını. Ankara.
- Haleem, A., Javaid, M. & Vaishya, R. (2020). Effects of COVID-19 pandemic in daily life. *Current Medicine Research and Practice*, 10(2), 78.
- Hou, F., Bi, F., Jiao, R., Luo, D. & Song, K. (2020). Gender differences of depression and anxiety among social media users during the COVID-19 outbreak in China: a cross-sectional study. *BMC Public Health*, 20, 1-11.
- İnanç, S. (2019). Artvin Kent Ormanı ve halkın beklentileri. *Turkish Journal of Biodiversity*, 2(2), 57-61.
- Le Quéré, C., Jackson, R. B., Jones, M. W., Smith, A. J., Abernethy, S., et al. (2020). Temporary reduction in daily global CO2 emissions during the COVID-19 forced confinement. *Nature Climate Change*, 10(7), 647-653.
- Li, Q. (2010). Effect of forest bathing trips on human immune function. *Environmental Health and Preventive Medicine*, 15, 9-17.
- Lopez, B., Kennedy, C., Field, C. & McPhearson, T. (2021). Who benefits from urban green spaces during times of crisis? Perception and use of urban green spaces in New York City during the COVID-19 pandemic. *Urban Forestry & Urban Greening*, 65, 127354.
- Lyu, B., Zeng, C., Xie, S., Li, D., Lin, W., Li, N., ... & Chen, Q. (2019). Benefits of a three-day bamboo forest therapy session on the psychophysiology and immune system responses of male college students. *International journal of environmental research and public health*, 16(24), 4991.
- Mahmud, S., Mohsin, M., Dewan, M.N., et al. (2023). The Global Prevalence of Depression, Anxiety, Stress, and Insomnia Among General Population During COVID-19 Pandemic: A Systematic Review and Meta-analysis. *Trends in Psychol.* 31, 143-170. <https://doi.org/10.1007/s43076-021-00116-9>
- Marzouk, M. & Othman, A. (2020). Planning utility infrastructure requirements for smart cities using the integration between BIM and GIS. *Sustainable Cities and Society*, 57, 102120.
- Maury-Mora, M., Gómez-Villarino, M. T. & Varela-Martínez, C. (2022). Urban green spaces and stress during COVID-19 lockdown: A case study for the city of Madrid. *Urban Forestry & Urban Greening*, 69, 127492.
- Olszewska-Guizzo, A., Fogel, A., Escoffier, N. & Ho, R. (2021). Effects of COVID-19-related stay-at-home order on neuropsychophysiological response to urban spaces: Beneficial role of exposure to nature?. *Journal of Environmental Psychology*, 75, 101590.
- Öztürk, A. & Türker, M. F. (2005). Farklı ilgi gruplarının orman kaynaklarına ve orman kaynaklarının sürdürülebilir yönetimine ilişkin görüşlerinin belirlenmesi: Maçka Devlet Orman İşletmesi örneği. *Kafkas Üniversitesi Artvin Orman Fakültesi Dergisi*, 6 (1-2) (2005), 135-145.
- Pfefferbaum, B. & North, C. S. (2020). Mental health and the Covid-19 pandemic. *New England Journal of Medicine*, 383(6), 510-512.

- Rajoo, K. S., Karam, D. S., Abdu, A., Rosli, Z. & Gerusu, G. J. (2021). Addressing psychosocial issues caused by the COVID-19 lockdown: Can urban greeneries help?. *Urban Forestry & Urban Greening*, 65, 127340.
- Rice, W. L., Mateer, T. J., Reigner, N., Newman, P., Lawhon, B., et al. (2020). Changes in recreational behaviors of outdoor enthusiasts during the COVID-19 pandemic: analysis across urban and rural communities. *Journal of Urban Ecology*, 6(1), juaa020.
- Rousseau, S. & Deschacht, N. (2020). Public awareness of nature and the environment during the COVID-19 crisis. *Environmental and Resource Economics*, 76, 1149-1159.
- Qiu, W., Rutherford, S., Mao, A. & Chu, C. (2017). The pandemic and its impacts. *Health, Culture and Society*, 9, 1-11.
- Saadat, S., Rawtani, D. & Hussain, C. M. (2020). Environmental perspective of COVID-19. *Science of the Total environment*, 728, 138870.
- Sandal, E. K. & Karademir, N. (2013). URLDetermination of people's expectations and consciousness with adequacy of green spaces in Kahramanmaraş. *Eastern Geographical Review*, 18(29), 155-176.
- Sang, Å. O., Knez, I., Gunnarsson, B. & Hedblom, M. (2016). The effects of naturalness, gender, and age on how urban green space is perceived and used. *Urban Forestry & Urban Greening*, 18, 268-276.
- Saunders-Hastings, P. R. & Krewski, D. (2016). Reviewing the history of pandemic influenza: understanding patterns of emergence and transmission. *Pathogens*, 5(4), 66.
- Saxena, A., Dutta, A., Fischer, H. W., Saxena, A. K. & Jantz, P. (2021). Forest livelihoods and a "green recovery" from the COVID-19 pandemic: Insights and emerging research priorities from India. *Forest Policy and Economics*, 131, 102550.
- Slater, S. J., Christiana, R. W. & Gustat, J. (2020). Peer Reviewed: Recommendations for keeping parks and green space accessible for mental and physical health during COVID-19 and other pandemics. *Preventing Chronic Disease*, 17: E.59.
- Spano, G., D'Este, M., Giannico, V., Elia, M., Cassibba, R., et al. (2021). Association between indoor-outdoor green features and psychological health during the COVID-19 lockdown in Italy: A cross-sectional nationwide study. *Urban Forestry & Urban Greening*, 62, 127156.
- Türker, Y. Ö. (2011). The legal principles for utilization of non-wood forest products. *Journal of the Faculty of Forestry, Istanbul University*, 61(1), 13-21.
- URL-1 (2020). <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19>. (Accessed 11-march-2024)
- URL2.https://www.nufusu.com/ilce/merkez_barti_n-nufusu (Accessed 15-february-2024)
- Weinbrenner, H., Breithut, J., Hebermehl, W., Kaufmann, A., Klinger, T., Palm, T., & Wirth, K. (2021). "The forest has become our new living room"—the critical importance of urban forests during the COVID-19 pandemic. *Frontiers in forests and global change*, 4, 672909.