

Concept Paper

The Benefits of Blockchain Technology for Medical Tourism

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Abstract: The paper discusses the benefits of blockchain technology for medical tourism. The major focus is placed on pre-procedure and post-procedure of medical tourism. The authors argue that blockchain technology can facilitate several stages of medical tourism by enabling disintermediation, allowing cryptocurrency payments, ensuring secure data sharing and privacy, and empowering trusted review systems. With regard to COVID-19 pandemic, the paper outlines the current challenges of the medical tourism industry and proposes the opportunities for blockchain technology use. The paper attempts to provide important insights regarding the positive implications of blockchain technology use within the medical tourism industry as well as to further advance the current knowledge about blockchain technology's effects for medical tourism.

Keywords: disrupted technology; blockchain technology; medical tourism; COVID-19



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1. Introduction

Medical tourism is a rapidly boomed trend in tourism that has recently gained enormous popularity. Each year more and more individuals travel abroad to receive health care services. Despite the difficulty to confirm exact statistics for medical tourism, the number of medical tourists worldwide in 2019 was estimated at 23,043 thousand and was expected to reach 70,359 thousand by 2027 [1]. According to a report published by [1], the global medical tourism market was valued at USD 104.68 billion in 2019 and was projected to reach USD 273.72 billion by 2027. However, these projections are likely to go down in light of the COVID-19 pandemic. Among the dominant factors contributing to the recent growth of the medical tourism industry are affordable health care technologies [2], cost-effective transportation facilities [3] as well as an increased level of promotion by countries as medical tourism destinations [4]. The number of countries marketing themselves as medical tourism destinations has significantly grown since this new sector represents a lucrative economic opportunity for such destinations [5].

The important role of information technologies in the tourism industry is undeniable [6]. With the rapid digitisation of healthcare, medical tourism destinations and medical service providers may use technological innovations for providing personalized healthcare delivery services and attracting new tourists. Internet has been revealed as playing an important role in providing information for the prospective medical tourists and connecting them with the healthcare providers [7]. Prior research has confirmed that there are information systems that can be profitably integrated into medical tourism, such as destination management organizations websites [8], electronic health record systems [9], or point-of-sale systems for cosmetic services [10].

Blockchain technology is perceived as a foundational technology since potentially new social and economic systems can be based on blockchain [11]. Recently, blockchain technology and cryptocurrencies have become hot topics in tourism and hospitality research. However, in regard to medical tourism research, there exists only a handful of published articles analyzing the impacts of blockchain technology on medical tourism. Focusing

on several blockchain's features, [12] address some open questions in medical tourism regarding patient-doctor trust, procedure and risk transparency, and medical record privacy. Innovative technology such as blockchain can enable the continuous growth of medical tourism. Ref [13] states that blockchain technology can allow promotion of decentralized travel solutions and better management of electronic health record systems, help create smarter medical devices, and assist to issue tamperproof medical certificates. Ref [14] study the potential of blockchain technology to protect healthcare data hosted in a cloud-based environment. Ref [15] reveal that blockchain technology can ensure disintermediation in the medical tourism industry, increase clarity in communication, trust and transparency, mitigate a key challenge of cost rising, and facilitate collaboration between the stakeholders. Ref [16] focuses on the importance of cryptocurrency use in the medical tourism industry and statistically confirms the positive correlation between the use of cryptocurrencies and intentions of medical tourists. Yet, further academic research is needed to provide full understanding of the impacts of blockchain technology on medical tourism. There are two main stages in medical tourism: pre-procedure and post-procedure. The authors of [17] have emphasized the information technologies' strategic role in medical tourism in terms of assisting the tourists in both the pre-procedure and post-procedure of medical tourism. However, the benefits of blockchain technology for pre-procedure and post-procedure have not been addressed in the previous literature.

Therefore, the authors of this paper intend to conceptualize the benefits of blockchain technology for the pre-procedure and post-procedure of medical tourism. Ref [18] emphasizes that it is crucial to focus on how blockchain technology can be used for the benefit of consumers and suppliers. This conceptual paper aims to extend the previous research and contribute to the existing literature regarding the benefits of blockchain technology for medical tourism, specifically for pre-procedure and post-procedure. The rest of the paper is organized as follows. The second section provides a literature review on medical tourism, the role of information technology in medical tourism, and blockchain technology. The third section presents the possible benefits of blockchain technology for medical tourism. The fourth section resumes the challenges of medical tourism in light of the pandemic and outlines the opportunities for blockchain use. Finally, the last section presents main conclusions and future work.

2. Literature Review

2.1. Medical Tourism

Medical tourism, which included traveling abroad for healthcare benefits, existed several centuries ago. In the 18–19th century, many people from Europe traveled to remote locations to use spas regarded as having health-enhancing properties [19,20]. Travelers from different locations looking for health improvement have visited India in order to practice Yoga and Ayurveda healing techniques that have been popular for 5000 years. In Japan, mineral springs have attracted people travelling for medical purposes for over 1000 years [21]. So far, as popularity of worldwide travel is growing, more and more people are traveling abroad and aligning their trips with healthcare services.

In early 2000s, medical tourism has emerged as a new niche in the tourism industry. Among the factors that favorably contributed to the emergence of a new form of tourism were high costs and long waiting lists at home country, innovative technologies and skills in destination countries, reduced transport costs, and Internet marketing [22]. The concept of medical tourism is comparatively new and does not have a unique definition. Though different definitions of the concept have been provided (Table 1), the literature agrees that medical tourism takes place when an individual travel abroad in order to receive specific medical services.

Table 1. Definitions of medical tourism.

Reference	Definitions
[22]	“Medical tourism has emerged from the rapid growth of what has become an industry, where people often travel long distances to overseas countries to obtain medical, dental and surgical care while simultaneously being holidaymakers, in a more conventional sense”
[23]	“Vacation that involves travelling across international borders to obtain a broad range of medical services. Medical tourism usually includes leisure, fun, and relaxation activities as well as wellness and health-care service”
[24]	“The act of travelling abroad to obtain medical care”
[7]	“Medical tourism takes place when individuals opt to travel overseas with the primary intention of receiving medical treatments”
[25]	“International travel with the aim of improving one’s health”
[26]	“Medical tourism refers traveling to a remote country with the purpose of availing medical facilities”

The scholars undertook research on medical tourism from different perspectives and within a variety of contexts. Ref [27], in one of the earliest academic studies in the field, indicated that the concept of medical tourism could be used as an effective marketing strategy. Some studies attempted to explain the importance of medical tourism. For example, Ref [28] identified medical tourism through a conceptual framework comparing implications for health sectors in Malaysia, Singapore, and Thailand. Ref [22] argued that medical tourism would continue to grow because of privatization and cost differentials between states. Ref [23] proposed a theoretical framework for the study of medical tourism emphasizing demand and supply perspectives. Other studies expressed concern regarding potential biosecurity and nosocomial risks associated with international medical tourism [29,30]. Empirical studies investigated the profiles of medical tourists and examined the behavioral intentions. For instance, Ref [31] explored the links among perceived medical and service quality, satisfaction, trust, and price reasonableness and their effect on the medical tourists’ intentions. A recent study by [32] investigated the impacts of country-specific and social factors on perceived value and the intention to revisit of Chinese medical tourists.

Medical tourism literature highlights several crucial motivational factors affecting the individuals’ decision to seek medical treatment abroad as follows:

Lower cost. Some medical services provided by overseas healthcare service providers may be cheaper than the services available in the tourist’s home country [33].

Quality. Some healthcare service providers are perceived to be of high quality because they account for hospitals and doctors with global benchmarking and affiliation [34].

Reduced waiting time. Within medical tourism destinations, the healthcare services are available in a timelier manner that attract the tourists who wish to avoid long waiting times [15,35].

Availability and accessibility. As the medical tourism market grows, new treatments become available for the tourists. In addition, some treatments that are illegal at the medical tourist’s home country, are accessible in a foreign medical tourism destination [21].

Regulation. Existence of the legal jurisdictions regulating the access to healthcare procedures promotes medical tourism [36].

Although medical tourism plays an important role in meeting the medical tourists’ sensitive and critical needs and desires, uncertainty still resides in every stage of the medical tourism process including pre-procedure and post-procedure (12). For instance, at the pre-procedure stage, tourists usually look for medical tourism intermediaries who help prepare and arrange tourists’ itineraries. However, many intermediaries are not externally evaluated or officially authorized (22) and provide some unreliable, ineffective, and/or poor-quality medical services. At the post-procedure stage, tourists often have to follow up post-treatment routine either in the same international hospital or in a local one. As a result, the hospitals digitize medical records and share them with all interested parties. It is very important to emphasize privacy and security issues resulting from digitization and sharing of medical records (12). To ensure the sustainability of medical tourism, it is necessary to cultivate and advance the growth of a more trusted and transparent medical tourism segment. The stakeholders should re-design their medical tourism processes

and acquire the full benefits of information technologies that can contribute to the better medical tourism experience ([37]).

2.2. Medical Tourism and Information Technology

Medical tourism is deeply connected with globalization and the information technology revolution that has eased information availability to prospective medical tourists [25]. Undoubtedly, the Internet plays an important role in the medical tourism industry through facilitating the access to relatively objective and trustworthy information [38]. Recently, more and more tourists search Internet in order to collect information regarding medical tourism destination, healthcare provider, and available medical treatments before they decide to travel overseas [39]. Websites, informational pages, social media sites are among the most popular mediums of information about medical tourism and healthcare. Social media sites enable the creation and sharing of user-generated content [40]. Using social media, the individuals can share their medical tourism experiences; from the other side, the prospective tourists can find the necessary information, which they perceive as reliable and trustworthy.

Due to the development of innovative technologies, the medical tourism industry has turned into more customer-oriented industry, where healthcare service providers are constantly seeking new approaches to enhance customer satisfaction [41]. Online medical tourism agencies have appeared in the market; they perform the role of middlemen between a medical tourist and healthcare service provider by offering transparency and security [42] and are responsible for everything the tourists need or require during the different phases of medical tourism. Another innovation is electronic health records that provide doctor transparency to their medical tourists' healthcare records regardless of their location. Moreover, information technologies are used for developing different applications, for instance, application for remote monitoring the tourists' condition or application for medicine reminding [17].

Healthcare providers have to follow technological innovations in order to compete within the scope of medical tourism and facilitate compliance with them [43]. Among the modern technologies are Internet of Things (IoT), automation, robotics, virtual reality, artificial intelligence, cloud solutions, big data analytics; these technologies enable the healthcare service providers to streamline processes, synthesize information, and provide updates in real time [44]. Blockchain technology is a new promising technology that is expected to significantly impact the medical tourism industry [12]. Several medical tourism destinations have accepted blockchain based cryptocurrencies and their transactions as their priority to gain the competitive advantage in terms of security and transparency [16].

The literature argues that blockchain technology has a potential to address some challenges within the sector of medical tourism. As such, Ref [12] point out that blockchain technology is able to change power relationships among key players of the medical tourism industry, enable informed decisions in the selection of the medical tourism destinations, improve and secure the flow of medical information, and ensure a permanent availability of the procedural interventions, transactions, and entire medical history. Furthermore, Ref [14] focus on the secure keeping and management of healthcare data emphasizing that blockchain can be effectively used as a database for all medical data or as a storing place of all hashes of medical data that are kept outside blockchain in a conventional or distributed database. Ref [16] argues blockchain based cryptocurrencies and transactions positively affect medical tourism in terms of protecting stakeholders from monetary risk, facilitating access to medical services, providing evidence in a possible malpractice case, and increasing competitive advantage.

2.3. Overview of Blockchain Technology

Blockchain technology has received enormous attention since its first application, the cryptocurrency Bitcoin, became successful and popular on the global marketplace. Proposed in 2008 by the presumed anonymous Satoshi Nakamoto, Bitcoin cost around \$0.10 USD in 2009, reached the point of \$20,000 USD in December 2017, and hit a new high of more than \$44,000 in February 2021. In the paper “Bitcoin: A Peer-to-Peer Electronic Cash System” Nakamoto introduced electronic cash enabling online payments to be sent directly from one party to another without intermediaries [45]. Though many people see blockchain linked to Bitcoin, blockchain technology is applicable to any digital asset transaction exchanged via Internet [46]. Bitcoin’s success has led to the exponential growth of crypto market with more and more new cryptocurrencies. Although blockchain technology has been mainly implementing in the financial sector, it is finding new range of applications in other sectors and industries as health, governance, and tourism [47].

Blockchain is a distributed database of chronological transactions stored on the blocks that are attached to each other. All information is duplicated and deployed among multiple computers, called nodes, in the blockchain network. All participants should agree in whether transactions are trustworthy and should be added in the blockchain [47]. Besides, all nodes are encouraged to check the correctness of each new transaction. Since modifying and deleting the already entered records require enormous efforts, the data can be deemed secure. Every following block accommodates a hash number generated from the transaction information and also a hash number of the previous block. The hash number differs if any modifications are made, thus letting easily spot any alterations in the blocks and more accurately track the data [48]. A typical blockchain work process is depicted at Figure 1.

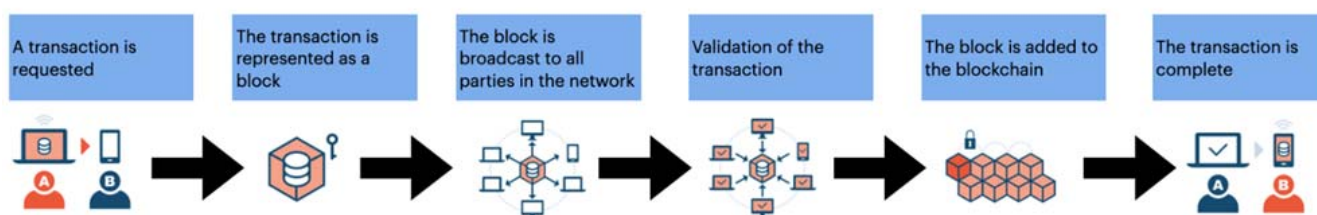


Figure 1. A typical blockchain work process [49].

When a transaction is requested, it is converted into a hashed block, which contains information regarding date/time, sender, receiver, asset type, and quantity, and stored as candidate to be printed on the ledger [50]. Then, the block is broadcast to a network of all nodes for its validation. Once validated, the block is added to the chain of blocks, which finalizes the transaction completion.

Blockchain technology has a potential to revolutionize many industries due to its specific characteristics. Among the key advantages of blockchain technology are:

Disintermediation. The peer-to-peer nature of blockchain eliminates the need of having a central authority.

Data integrity. Any data that is added to the blockchain cannot be modified or deleted, which finally provides a very high level of security.

Traceability. All data can be traced to authenticate their origin and path.

Security. The block encryption in the chain and providing a unique identity for each user of blockchain assure the high range of security.

Faster processing. In comparison with the traditional banking process that usually takes around three days to process a transaction, blockchain technology significantly reduces the processing time, which can take only minutes or even seconds.

Reduced costs. Costs can be cut because of the elimination of the intermediaries.

Trust. All users of blockchain can trust each other and deal directly with each other.

Despite the advantages, blockchain technology also accounts for some disadvantages:

Energy use. Mining blocks and keeping a real-time ledger consumes enormous amount of energy. The energy consumption of only Bitcoin miners in a particular year was more than the per capita energy consumption of an individual country.

High operating costs. Small scale companies consider operating Bitcoin as unprofitable.

Uncertain regulatory status. Lack of regulation hinders the acceptance and wide use of cryptocurrency by the preexisting financial institutions.

With regard to the types of blockchain, there are two types: public and private. Public blockchain is for everyone and anybody in the chain can participate in the consensus-making process. Private blockchain is for a closed community keeping the transactions that are of interest to only members of that chain. Another form of private blockchain is the federated or consortium model that is characterized by pre-selected nodes, which control the consensus process. The major differences between public and private blockchain are summarized in the Table 2.

Table 2. Differences between public and private blockchain [51].

	Public Blockchain	Private Blockchain
Access	Anyone	Single organization
Authority	Decentralized	Partially decentralized
Transaction speed	Slow	Fast
Consensus	Permissionless	Permissioned
Immutability	Full	Partial
Data handling	Read and Write access for anyone	Read and Write access for a single organization
Efficiency	Low	High

3. Benefits of Blockchain Technology for Medical Tourism

This section elaborates on the benefits of blockchain technology for pre-procedure and post-procedure of medical tourism. The benefits of blockchain technology for medical tourism are summarized in the Figure 2.

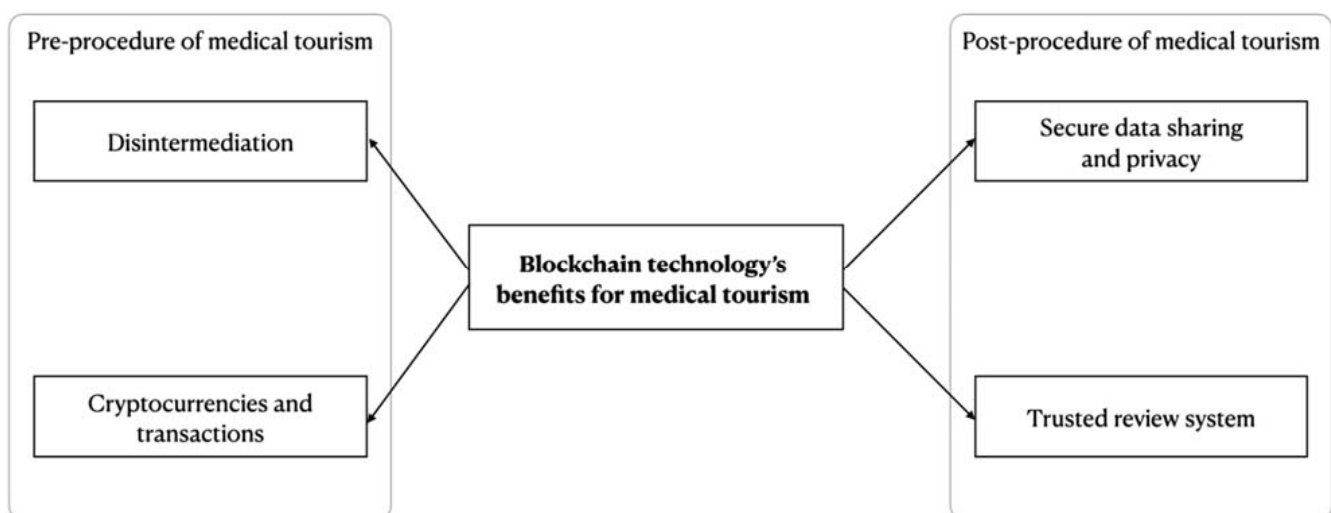


Figure 2. Benefits of blockchain technology for medical tourism.

3.1. Blockchain Benefits for Pre-Procedure of Medical Tourism

Pre-procedure is the first phase of medical tourism, which involves preparation by a medical tourist to receive medical service [24]. The phase consists of several important stages as finding information, finding medical tourism facilitator, finalizing logistics and course of action, pre-medical check-up, and medical intervention. Blockchain enabled disintermediation and blockchain based cryptocurrencies and transactions can facilitate some stages of pre-procedure of medical tourism.

Disintermediation. With the growth of medical tourism market, many travel agencies turn into medical tourism facilitators that play the role of the intermediaries between the medical service providers and the medical tourists [22]. The medical tourists often cannot assess the suitability and quality of a medical tourism destination, and therefore, have to find and rely on the medical tourism facilitators to answer queries and arrange their itineraries [12]. Meanwhile, the medical tourists have to contract the medical tourism packages at higher prices than actual cost of the medical service providers [12] and are limited to the available options due to the medical tourism facilitator's affiliation with certain medical providers [52]. Another question is related to whether the medical tourism facilitators are legally accountable for any failures resulted from medical services [53]. Blockchain technology can significantly lessen the power of the medical tourism facilitators or effectively remove them due to its ability to build trust, ensure more secure information exchange, reduce costs, and enable transparency [54]. Hence, blockchain technology can enable the medical tourists to directly communicate with the medical service providers. As for the medical service providers, blockchain technology opens up equal possibilities for attracting the prospective medical tourists by the biggest hospitals as well as new and less popular medical service providers. Blockchain technology ensures the origin, quality, and transparency of the data, so the medical tourists could verify the medical service providers' qualifications and certifications and be assured that the procedural costs are same for all.

Cryptocurrencies and transactions. Blockchain based cryptocurrencies and transactions can facilitate the logistics that has to be finalized in the pre-stage of medical tourism. Cryptocurrencies facilitate easy, direct, and safe peer-to-peer transactions without the need for a trusted third party [55]. Therefore, both medical tourists and medical service providers could benefit from secure payments, easy use, rapid processing, reduced waiting times, and secure archiving of health records [16]. In addition, cryptocurrencies and transactions provide efficiency in international transfer with neither storage cost, nor transfer fee [56] to the medical tourists and a competitive advantage to the medical service providers [57].

3.2. Blockchain Benefits for Post-Procedure of Medical Tourism

Post-procedure is the second phase of medical tourism that involves post-operative care and follow-up care of the medical tourists [24]. This phase consists of the following stages: monitoring for complication, physical therapy and progress check, follow-up care, medicine instruction and post-treatment leisure, dues clearance and return home, and follow-up care by local healthcare provider. Blockchain technology can be used as a secure database for the medical tourists' health records as well as a trusted review system.

Secure data sharing and privacy. Effective and secure exchange of medical records is important for post-operative care and follow-up care of the medical tourists. Blockchain technology can enable an effective and fast sharing of health data among the medical tourists, foreign medical service providers, local medical service, and other stakeholders [58]. Blockchain technology can be used as a perfect database for recording, maintaining, and managing the medical tourists' health data as well as the prescribed medications. The interoperability of blockchain system enables the medical tourists to access their health history and records through the decentralized system. In addition, healthcare providers can share data concerning a medical tourist to maintain the continuum of care [59]. Due to its characteristics as immutability and traceability, blockchain technology ensures the integrity of medical information. Neither medical service provider, nor medical tourists can change or delete the inserted records. In addition, with regard to privacy issues, blockchain technology enables the medical tourists to maintain control over their medical records [60]. Therefore, the medical tourists decide on which information, with whom and how they want to share [61]. The medical tourists' privacy concerns are likely to tend to reduce, since they have full knowledge of the flow and use of their personal information [62].

Trusted review system. Prospective medical tourists often search reviews when selecting a medical tourism destination or medical service provider. Meanwhile, the medical tourists who already received a medical service tend to leave reviews regarding their experiences. Empowering trusted review system, blockchain technology has potential to assure the trustworthiness and authenticity of the reviews. Blockchain technology is able to provide a unique private key for each identity with several independent verification processes integrated into the review systems [55]. This could ensure the reduced rates of manipulation or duplication of reviews [54]. Some medical tourists do not write reviews since they do not want somebody to recognize them. However, this issue can be tackled by blockchain technology, which is able to maintain anonymous the reviewers. In addition, blockchain based review systems can reward coins or tokens to the medical tourists who leave reviews and share their experiences.

4. Limitations of Blockchain Use in Medical Tourism

Blockchain technology has limitations that must be considered when applying in the medical tourism sector.

One of the major limitations is related to the storage and management of data. The data integrity characteristic of blockchain results in immutability, so any data, once entered blockchain, cannot be deleted or modified. However, since healthcare data are under the protection of privacy laws, they must be erased if the medical tourists request it [14]. Therefore, anyone intending to use blockchain to store healthcare data must think twice before doing it. In addition, while blockchain can be perfectly used as a database recording the medical tourists' data, it is not suitable for storing the large volumes of data or high velocity data because of the massive redundancy from many processing nodes holding a full copy of all data [63]. To overcome this limitation, only a hash or other meta-data can be saved on blockchain, whereas primary data are stored off-chain [14]. In addition, if the hacker transactions take place, that will be very hard to undo [64].

Though blockchain preserves anonymity and privacy, the security of assets/data depends on protecting the private key, which is a form of digital identity. If one's private key is lost or stolen, no third party can recover it, meaning assets/data vanishment [65]. To protect a private key, it is necessary to interconnect the identity management of every chain with another blockchain-based biometric data set [66].

Another limitation of blockchain use lies in lack of standardization of blockchain architectures. This can impede the establishment of business connections between healthcare providers by implementing blockchain architectures because of the difficulties of integrating different architectures [50].

In addition, regulation constrains in medical applications prevent the rollout of smart contracts in several countries [50].

Lastly, there is always a sustainability issue regarding the electricity waste. Blockchain systems will continue to require more electricity than a centralized, non-replicated database [63].

However, professionals and stakeholders are making efforts to overcome these limitations of blockchain technology. Recent developments in regulatory easing, collaborations between organizations, and the development of more efficient blockchain architectures are some examples that can help foster blockchain adoption [67].

5. Opportunities for Blockchain Use Due to COVID-19 Pandemic

The outbreak of COVID-19 pandemic has tremendously affected the human population and almost every sector and industry. Medical tourism industry is impacted globally in different ways. Many countries have restricted the movements and have imposed lasting lockdowns, curfew, and other social distancing measures. Most flights, including those to the popular medical tourism destinations, have been canceled, local and intercity traffic has come to a halt, and many tourism-related businesses (hotels, restaurants, attractions) have been closed [18]. Healthcare system in the medical tourism destinations is also highly affected by COVID. Instead of providing hospital rooms or treatment units for the inter-

national medical tourists, many hospitals have had to treat COVID cases and develop COVID recovery units [68]. Most hospitals could perform only emergency procedures; other non-essential procedures have been postponed or canceled. Furthermore, the safety measures against COVID undertaken by a healthcare provider are crucial for the high reputation and competitiveness perceived by the international medical tourists [62].

However, despite the challenges of pandemic for the medical tourism industry, there may exist several opportunities for blockchain use. First, blockchain technology is more likely to be used as a secure database for keeping and sharing patients' health records data among several doctors and patients. Pandemic forced the digitization of the medical tourism industry in terms of encouraging telemedicine. Using video-streaming and video-conferencing tools, the doctors from around the globe can consult and treat both domestic and foreign patients. Sometimes, there are cases that require a discussion of opinions of several doctors, or substitution of a doctor. In such cases, the patient can securely and quickly send the necessary information to the doctors.

Second, blockchain technology can be used for issuing and verification of the digital certificates confirming high-quality accreditation of the medical tourism service providers. In the context of pandemic, medical tourists are more likely to prefer such medical tourism service providers, which account for accreditation that ensures compliance with World Health Organization guidelines and national health regulatory standards [20]. Blockchain based platforms will verify the issuers and recipients of the certificates, ensure the authenticity of the certificates, and reveal fake certificates.

In addition, blockchain technology can be used for issuing digital certificates with PCR test results and other health related records. PCR test certificates are one of the compulsory requirements that must be met by a traveler when exiting and entering a certain country. Blockchain technology can eliminate the fraud and manipulation of such certificates and assure their authenticity. Also, the tourists will have full control of the records and will grant the access to the authorities who need it.

Finally, blockchain technology can be used for visa issuance for medical tourists. Medical tourists often need visas for visiting a medical tourism destination. Issuing visas takes time and in case of emergency the medical tourists do not have a lot of time for waiting a visa. Blockchain technology can significantly reduce the waiting times through effective managing all travel related government documents including visa issuance.

6. Conclusions

The major aim of this conceptual paper was to extend the previous research and add to the existing literature regarding the benefits of blockchain technology for medical tourism. Previous research [17] explored the role of information technologies in pre-procedure and post-procedure of medical tourism; however, it did not focus on the positive role of blockchain technology. To add more knowledge, this paper primarily focused on the possible strategic role of blockchain technology and has conceptualized the benefits of blockchain technology for two main stages of medical tourism: pre-procedure and post-procedure. Therefore, the paper argues that medical tourists as well as healthcare providers may benefit from the application of blockchain technology in terms of an easier way to find a healthcare provider, fast and secure payment method, ensured data security and privacy, and trusted review systems. In addition, the paper extends the current literature within tourism research on blockchain, proposing the possible implications of this innovative technology for the medical tourism sector.

The paper is timely and appropriate considering the COVID-19 pandemic. The pandemic affected the whole tourism industry including the medical tourism sector. To address this issue, the paper has summarized several challenges the medical tourism industry is facing due to the pandemic and has outlined some opportunities for blockchain technology use in the current situation, such as the reduction in waiting times for all travel-related government documents including visa issuance and the authenticity guarantee of these documents.

While the paper has provided several insights for benefits and opportunities of blockchain technology for medical tourism, it has several limitations. The scope is limited as the paper only focused on several stages of pre-procedure and post-procedure of medical tourism. In addition, more thorough qualitative research and empirical data are important for deeper understanding on the potential of blockchain technology for the medical tourism industry. It will be of great importance to conduct review studies to find out more possible domains of medical tourism that can be affected by application of blockchain technology. In addition, the researchers need to address the challenges of blockchain adoption and threat of application of blockchain technology in the medical tourism sector. Future studies are encouraged to explore the effects of blockchain technology on the increased competitiveness and reputation of the medical service providers or enhanced experience of the medical tourists.

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