



# ASOS JOURNAL

The Journal of Academic Social Science

*Akademik Sosyal Arařtırmalar Dergisi, Yıl: 7, Sayı: 88, Şubat 2019, s. 564-573*

*ISSN: 2148-2489 Doi Number: <http://dx.doi.org/10.16992/ASOS.14724>*

*Yayın Geliş Tarihi / Article Arrival Date*

*16.01.2019*

*Yayınlanma Tarihi / The Publication Date*

*25.02.2019*

**Arş. Gör. Haşim ÇAPAR**

İstanbul Sabahattin Zaim Üniversitesi, Sağlık Yönetimi  
hsmcpr07@hotmail.com

## **A NEW PAYMENT MODEL: USE OF ENCRYPTED CURRENCY AND TRANSACTIONS IN MEDICAL TOURISM**

### **Abstract**

**Objective:** the purpose of this study is to develop a scale for the use of encrypted currency and transactions in medical tourism as a payment model.

**Methods:** scale reliability was tested using item analysis for internal consistency (coefficient alpha) and test-retest reliability estimates. Principal components factor analysis was used to determine the theoretical fit of the measures with the data.

**Results:** principal component analysis for factor analysis was performed and a one-factor solution was provided as expected (eigenvalue = 5,135, 54,1% of the variance explained). The factor loadings ranged from 0.41 to 0.82 among 10 items.

**Conclusion:** the validity and reliability study of the Scale of the Advantages of the Use of Encrypted Currency and Transactions in Medical Tourism in Term of Health Service Providers was scientifically conducted and it was found that the scale gave very harmonious results.

**Keywords:** Encrypted Currency and Transactions, Medical Tourism, Health Service Providers, Payment Model.

## KRİPTOLU PARA BİRİMİ VE İŞLEMLERİNİN MEDİKAL TURİZMİNDE KULLANIMI: YENİ BİR ÖDEME MODELİ

### Öz

**Amaç:** bu çalışmanın amacı, bir ödeme modeli olarak kriptolu para birimleri ve işlemlerinin medikal turizmde kullanımı ile ilgili bir ölçek geliştirmektir.

**Metot:** ölçeğin güvenilirliği ile ilgili iç tutarlılık için madde analizi (alfa katsayısı) ve test-tekrar test güvenilirlik tahminleri kullanıldı. Ölçeğin ölçümlerinin teorik olatacak uygunluğu için ise temel bileşenler faktör analizi kullanıldı.

**Bulgular:** faktör analizi için temel bileşenler analizi uygulandı ve beklendiği gibi tek faktörlü (özdeğer= 5,135, açıklanan varyans= % 54,1) bir yapı elde edildi. Faktör yükleri, 10 madde üzerinden 0,41 ile 0,82 arasında bir değerle sıralandı.

**Sonuç:** ölçeğin geçerlilik ve güvenilirlik çalışması bilimsel olarak yapıldı ve elde edilen veriler ışığında ölçeğin, çok uyumlu sonuçlar verdiği bulundu.

**Anahtar kelimeler:** Kriptolu Para Birimi ve İşlemleri, Medikal Turizm, Sağlık Hizmet Sunucuları, Ödeme Modeli

### Introduction

With the globalization, the tendency of technology to exceed the borders of the country is increasing day by day. It is known that the encrypted currencies and transactions, which are candidate to take over the state's duty of approval, become a global phenomenon used by most individual and corporate users. The fact that the health sector is a highly sensitive area of technology is also naturally affected by emerging technologies. The emergence of a sector such as medical tourism as a value-added economic sector has also raised the use of crypto currencies and transactions in the health sector.

The aim of this study is to develop a scale which will reveal the advantages of encrypted currencies and transactions used in different sectors for different purposes and also in medical tourism and its advantages in terms of health service providers.

### Encrypted Currency and Transactions

In fact, the first inventor of the crypto currency known to many few people is a person named Satoshi Nakamoto, who is clearly unknown to whom and where he is from (www.blockgeeks.com, 2018). Satoshi Nakamoto announced the development of "Bitcoin protocols" through its web page "Cryptography Mailing List" Towards the end of 2008 and developed the "Inter-peer Electronic Cash system" (www.coinkolik.com, 2018). Although many people wanted to develop digital money in the 90s, they were not successful. Thanks to a non-centralized digital cash system, Satoshi Nakamoto successfully developed a digital currency "Bitcoin". Basically, "Bitcoin" is a digital coin created with computer codes. Bitcoin can be said to be based solely on peers or inter-peer Internet protocols, regardless of all government inspections. Bitcoin can also be called an encrypted set of data or a currency consisting of complex codes (www.blockgeeks.com, 2018; www.cryptostache.com, 2019).

## **The Purpose and Fields of Use of the Encrypted Currency and Transactions in the Medical Tourism**

The existence of a sustainable health economy is inevitable for the uninterrupted supply of health services. Health economics should be adapted to health services by integrating new instruments brought by the change and transformation in the economy, not with a classical understanding of economy.

It is seen that the medical tourism market becomes a major sector when it is taken to the health service servers. It requires health service providers to be open to global changes in order to provide a quality service for sustainable healthcare.

It is stated that approximately 3% to 4% of the world's population receive health services from other countries every year (Medical Tourism Index 2016 Reported, 2017). It is of vital importance for healthcare providers in such a large sector to pay attention to the characteristics determined as criteria in the selection of destinations in medical tourism (Çapar, 2018: 90).

It is certain that the safety of potential medical tourists who want to receive health care in a foreign country or region should be considered by both countries and health care providers. It is said that payment systems should be tried for the service cost which minimizes security vulnerabilities. One of these systems is the use of encrypted currencies and transactions in medical tourism (Matthew, 2017: 275). Patient safety and health care costs are the most important criteria for medical tourists (Çapar, 2018: 92).

Medical tourism refers to a form of health service delivery that breaks the boundaries of access to health services and facilitates health care outside the country. Medical tourism, while breaking these limits, also uses a new, transparent and reliable payment model in health services. This payment model is a system called crypto currency and transactions, which provides a highly secure money flow in a digital environment and is a means of payment between healthcare providers and medical tourists (Jagyasi, 2018; Browne, 2017).

The health sector in the world is said to be a global sector that is worth hundreds of millions of dollars and rapidly growing and naturally requires a high security payment model (Jagyasi, 2018; www.cryptostache.com, 2019; Peterson, 2017).

After travel and tourism businesses, some renowned clinics and hospitals have started to accept cryptic currencies, especially Bitcoin as a means of payment (Jagyasi, 2018; www.cryptostache.com, 2019).

The encrypted currency and transactions are a payment model preferred by the rich in the purchase of medicines with cross-border taxes. This payment model reduces the costs of users and offers a secure shopping opportunity (Jagyasi, 2018; Peterson, 2017).

Health care providers consider their wishes because they don't want to lose potential wealthy customers. It is stated that the cancellation of some important operations due to the disruption of the money transfers in banks negatively affects both the health service providers and the health care recipients. The benefits of cryptic currencies and transactions should not be seen only as a payment model. These digital systems also prevent the disclosure of data by ensuring the safety of patient records. Cryptocurrency will reduce the cost of access to overseas healthcare facilities by eliminating cross-border exchange rates that are inevitable with the use of dollars and euros (www.cryptostache.com, 2019; Jagyasi, 2018; Browne, 2017; Peterson, 2017).

### **Advantages of Encrypted Currency and Transactions in Medical Tourism**

The health sector is a field where human resources, where many different field of expertise come together, are used intensively. Despite the labor-intensive sector, the service providers in the health sector, which are highly sensitive to technology, need to follow the new developments in order to compete with the possible competitors in the existing competitive environment and reflect the changes in the provision of health services in practice. Because medical tourism destinations that are used with high technology are preferable (Çapar, 2018: 95).

The information asymmetry that is considered to exist between the doctor and the patient changes with each passing day in favor of the patient. The reason that this gap of information is changed in favor of the patient can be explained by the effective use of internet technology, which is now external sources of information. Healthcare users living in the age of technology want to use the payment models that will feel more confident when choosing medical tourism mobility (Benchoufi and Ravaud., 2017: 1).

Health service providers know that it is a duty to meet the demands and desires of medical tourists, because they know that they have to shape themselves according to the demands of prospective healthcare buyers (Benchoufi and Ravaud., 2017: 4).

### **Advantages of Encrypted Currency and Transactions for Health Service Provider**

- Patient Accountability.
- Providing a competitive advantage through the fulfillment of patient's wishes and desires (Till et al, 2017:4).
- The patient is able to pay with the form of payment to be able to take place in the focal point (<https://www.forbes.com/sites/reenitadas/2017/05/08/does-blockchain-have-a-place-in-healthcare/#3589ede21c31>, 2018).
- The elimination of the delay of medical treatment due to bureaucratic obstacles (Swan, 2015: 110).
- Providing the possibility of providing services to more patients by providing the patient with the necessary conveniences (Skiba, 2017: 220).
- To increase competitiveness by ensuring safety and easy access criteria that are effective in the selection of medical tourism destinations (<https://medium.com/simplyvital/healthcare-and-cryptocurrency-3a34493d48d1>, 2018).
- To attract the attention of new potential medical tourists who follow the innovations (<http://www.medicaltourismmag.com/cryptocurrency-medical-tourism/>, 2018).
- A chance to express the differences in the promotion of advertising campaigns with the internet, which is one of the sources of external information (Nugent et al, 2016: 41).
- The chance to allocate more time to medical treatment (<https://www.mediledger.com>, 2018).
- More services in less time than the bureaucratic obstacles for payments (Yue at al, 2016: 5).

Considering the advantages given above, it seems that the encrypted currency and its operations facilitate both the security and the work of both parties as an important means of exchange

between patient and service providers which are important parties in medical tourism. In this context, it is thought that those who are trying to provide services in an important sector such as medical tourism should definitely take these advantages into consideration and develop policies towards this.

### **Scale Development**

As a result of the research conducted on the use of encrypted currencies and transactions in medical tourism; there was no measurement tool on the subject. In the light of the results of the literature study, it was decided to develop a new measurement tool for this new field. A questionnaire was created by the researcher and the questionnaire was sent to two researchers who were experts in the field. As a result of the comments and recommendations of the two experts, the final draft of the scale was applied to 257 people, who are managers or candidate managers in health institutions providing medical services within the scope of medical tourism.

### **Pilot Test**

In total, 87 managers or candidate managers completed the first major version of the measuring instrument as part of the pilot test and commented on the readability and article descriptions of the measuring tool items. The measuring instrument was later identified as 10 items for the Scale of the Advantages of the Use of Encrypted Currency and Transactions in Medical Tourism in Terms of Health Service Providers (AUECTMTTHSPScale) based on theoretical compliance and scope according to the comments and feedback made by the participants.

### **Materials and Methods**

This study is a methodological study of the validity and reliability of the Use of Encrypted Currency and Transactions in Medical Tourism in Terms of Health Service Providers (AUECTMTTHSPScale)

In this study, the online questionnaire form was used as data collection management. The general universe of this study constitutes managers or candidate managers who work in medical tourism sector. The universe can be reached in the general universe, March 2018-September 2018 on the web sites of medical tourism managers and candidate managers of medical institutions providing medical tourism services in different destinations, and the English-speaking 383 people.

During the research, the whole universe was tried to be reached, but 269 people accepted to participate in the research. During the collection process of the surveys, 264 questionnaires were answered by the participants. Only 257 of these surveys were completed correctly and completely. The turnover rate of the questionnaires was found to be 69 %. There are 10 items in the Scale of the Advantages of the Use of Encrypted Currency and Transactions in Medical Tourism in Terms of Health Service Providers (AUECTMTTHSPScale). It is recommended to reach 5 to 10 times the number of sample items in the scale studies when the sample size is determined (Comrey and Lee, 1992: 119). The number of participants to be sampled in this study was determined as  $n = 257$ .

The data collection form used in the research consists of two parts. In the first part, the socio-demographic characteristics of candidate managers and managers. In the second part, the Scale of the Advantages of the Use of Encrypted Currency and Transactions in Medical Tourism in Terms of Health Service Providers (AUECTMTTHSPScale)

The Scale of the Advantages of the Use of Encrypted Currency and Transactions in Medical Tourism in Terms of Health Service Providers (AUECTMTTHSPScale); is a measure of 10 items in only one factor to get the opinions of candidate managers or managers in the health institutions of different countries in terms of their benefits in medical tourism for the use of encrypted currencies and transactions for health service providers. Scale items; 5 Likert-type scaling method is defined as "1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree". The lowest score is 10 points and the highest score is 50 points. The high score on the scale shows that the use of encrypted currency and transactions in medical tourism has a high level of advantage for health service providers.

### **Sample Properties**

The ages of participants ranged from 36 to 78 (mean = 42; standard deviation = 7.076). According to the gender of the participants, women are not equal men (women N = 124; men = 133) but are seen to have a ratio close to each other. The sample selected for this study reflects the ethnic-cultural diversity of society, most commonly defined ethnic-cultural groups: European (N = 54, 21.01 % of the sample), Asian (N = 49, 19.07 % of the sample), Middle East (N = 52, 20.23 % of the sample), American (N= 56, 21.79 % of the sample), African (N = 19, 7.39 % of the sample) and Australian (N = 27, 10.51 % of the sample).

### **Data Analysis**

Advantages of the use of encrypted currency and transactions in medical tourism in terms of health service providers Scale (AUECTMTTHSPScale) discussed in this study was evaluated using SPSS 25 version and SPSS RELIABILITY command for internal consistency reliability. Factors for scale were determined using simple component approach analysis based on eigenvalues reported above 1 using principal component analysis with SPSS FACTOR (IBM corp. Released, 2017). This approach is based on priority hypotheses to guide the selection of the model. These are supported by slope testing and factor interpretability based on factor scale correlations. The results were considered to be good if the factor loads above 0.71 (50% overlap variance) were excellent, 0.63 (40% overlap variance) were very good and 0.55 (30% overlap variance) were good. Factor loads over than 0.40 were also considered appropriate if the scale was correlated with the only one factor (Comrey and Lee, 1992: 119).

### **Results**

Internal consistency and factor analysis result of the advantages of the use of encrypted currency and transactions in medical tourism in terms of health service providers is presented in Table 1. For each item in the measure, a 5-point likert type scale was used to answer each question with varying response options ranging from "strongly disagree" to "strongly agree".

Material analysis for the advantages of the use of encrypted currency and transactions in medical tourism in terms of health service providers (AUECTMTTHSPScale) was conducted on 10 items and found a very reliable and tight fit with an alpha ( $\alpha$ ) coefficient of 0.90. The item-scale correlations between the items ranged from  $r = 0.34$  to  $0.76$ . Prencipal component analysis for factor analysis was performed and a one-factor solution was provided as expected (eigenvalue = 5,135, 54,1% of the variance explained). The factor loadings ranged from 0.41 to 0.82 among 10 items.

**Table 1: Reliability and Factor Analysis of the Advantages of the Use of Encrypted Currency and Transactions in Medical Tourism in Terms of Health Service Providers (AUECTMTTHSPScale).**

Item	FaktorLoading	Mean Item-Total Correlation
Q1:...provides easier accountability to patients and their relatives	0.81	0.74
Q2:...provides easy access to stored information about the services provided	0.80	0.73
Q3:...prevent monetary losses of patients arising from exchange rate differences	0.78	0.71
Q4:...provides a cost close to the actual cost of healthcare services given to patients	0.71	0.63
Q5:...provides advantage against competitors	0.67	0.59
Q6:...make healthcare provider more preferred	0.63	0.56
Q7:...provides healthcare provider to serve more medical tourists	0.41	0.34
Q8:...provides healthcare provider to maximize profit more easily	0.82	0.76
Q9:...creates the image of an institution following technology and innovation	0.81	0.74
Q10:...facilitates healthcare provider to concentrate on the main service area	0.82	0.75
<b>Variance accounted for = 54.1 %</b>		
Coefficient alpha = .90		
KMO= .904		

...= Use of Encrypted Currency and Transactions in Medical Tourism

**Test-Retest Reliability**

**Table 2: Test-Retest Reliability Correlations of the Advantages of the Use of Encrypted Currency and Transactions in Medical Tourism in Terms of Health Service Providers (AUECTMTTHSPScale).**

	AUECTMTTHSPScale Score Time 1	AUECTMTTHSPScale Score Time 2
AUECTMTTHSPScale Score Time 1	-	<b>0.88**</b>

\*\*Correlation is significant at the 0.01 level (2-tailed).

Test-retest reliability of the AUECTMTTHSPScale (Time-Invariant): The test of test-retest measurement was made with 117 participant after 3 weeks. The total point average of the AUECTMTTHSPScale was  $25.87 \pm 8$  in the first test application and  $24.92 \pm 9$  in the re-test application. In the AUECTMTTHSPScale test-re-test reliability review, pearson correlation

analysis was made to assess the harmony between the two tests ' total scale score averages and the value was found to be  $r = 0.88$ . In addition, the difference between test re-test point averages for the AUECTMTTHSPScale was compared with Dependent Group T Test for significance analysis and no statistically significant difference was found ( $p > 0.05$ ).

### **Discussion**

The scale of advantages of the use of encrypted currency and transactions in medical tourism in terms of health service providers (AUECTMTTHSPScale) is a measurement tool that includes a number of items related to the use of encrypted currencies and transactions in medical tourism, and includes some features that are considered to be an advantage for medical tourism service providers. It is thought that these scale can be useful in measuring related issues, since the internal consistency level of scale is high and the test-retest reliability result is high.

Considering that the medical tourism and encrypted currencies are yet to be new, these two fields are related to each other, but they must be seated on a scientific basis to test it as one of the reasons for this study can be evaluated. There is a need for a variety of measurement tools to ensure that healthcare providers serving medical tourism provide the statistical information they need to accurately analyze and make policy requests.

As a result of the literature study, there was no scientific study on the use of encrypted currency and transactions in medical tourism. Therefore, since there is no study that can compare the current study, the topic of discussion has been terminated here.

### **Limitations and Opportunities for Further Research**

Firstly, as in every study, it is important to interpret this study with the awareness that it is carried out under its own limitations. In addition, the results should be assessed under the fact that encrypted currencies and transactions are shaped according to economic preferences and tendencies and under the fact that fluctuations in the economy. It is necessary to evaluate the results of the group in which the data of this study is collected and the tendencies, preference and requests of other groups may not be the same. With the assumption that this study alone will not be enough, researchers in the future should be supported by working with different groups at different times. In the future, the study carried out in this field with different segments and groups with different socio-economic status is considered to be able to fill the field where this study is restricted.

### **Conclusions**

With the preferability of medical tourism destinations, the measurement tools that are valid and reliable are needed in order to measure the relationship between the encrypted currency and transactions with each other. This study has been discussed in the usage and impact scale of the encrypted currencies and transactions in medical tourism, which have the potential to be preferred when medical tourists are choosing a medical tourism destination. Consequently, the study of the use of encrypted currencies and transactions in medical tourism has been evaluated based on some characteristics of medical tourism and encrypted currencies and transactions, and is a valid and safe measurement tool has been developed.

**REFERENCES**

- Benchoufi, M. and Ravaud P., (2017), Blockchain Technology For Improving Clinical Research Quality, BioMed Central, 18:335, p.1-5.
- Browne, R. (2017). Big transaction fees are a problem for bitcoin — but there could be a solution. <https://www.cnbc.com/2017/12/19/big-transactions-fees-are-a-problem-for-bitcoin.html>. Date of access: 02/5/2019.
- Capar, H, (2018), Factors Influencing Medical Tourism Destination Choice: A Study Aimed at Measuring Turkey's Perception of Foreign Medical Tourists. İstanbul University, Institute of Health Science, Department of Health Economics. (Unpublished Master's Thesis), İstanbul. p. 90.
- Comrey, A. L. and Lee, H. B., (1992), A first course in factor analysis (2nd ed.). Hillsdale, NJ, US: Lawrence Erlbaum Associates, Inc.
- <http://www.medicaltourismmag.com/cryptocurrency-medical-tourism/>, Date of access: 04/19/2018.
- <https://medium.com/simplyvital/healthcare-and-cryptocurrency-3a34493d48d1>, Date of access: 06/14/2018.
- <https://www.cryptostache.com/>, Date of Access: 02/5/2019.
- <https://www.forbes.com/sites/reenitadas/2017/05/08/does-blockchain-have-a-place-in-healthcare/#3589ede21c31>, Date of access: 06/10/2018.
- <https://www.mediledger.com/>, Date of access: 05/6/2018.
- IBM Corp. Released, (2017), IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.
- Jagyasi, P. (2018). Growth of Cryptocurrency in medical tourism – Do's and Don'ts. <https://www.linkedin.com/pulse/growth-cryptocurrency-medical-tourism-dos-donts-dr-prem-jagyasi/>. Date of Access: 02/5/2019.
- Matthew, B. H., (2017), An Introduction to the Blockchain and Its Implications for Libraries and Medicine, Medical Reference Services Quarterly, 36:3, 273-279.
- Nugent T.; Upton D. and Cimpoesu M., (2016), Improving data transparency in clinical trials using blockchain smart contracts [version 1; referees: 3 approved] *F1000Research* 2016, 5:2541.
- Peterson, B. (2017). The cost of bitcoin payments is skyrocketing because the network is totally overloaded. <https://www.businessinsider.in/The-cost-of-bitcoin-payments-is-skyrocketing-because-the-network-is-totally-overloaded/articleshow/62301717.cms>. Date of access: 02/5.2019.
- Skiba, D. J., (2017), The Potential of Blockchain in Education and Health Care, Nursing Education Perspectives, 38:4, p. 219-221.
- Swan, M., (2015), Blockchain Blueprint For A New Economy (Firs Edition), O'Reilly Media Inc., The United States of America, p.1-149.

- Till BM, Peters AW, Afshar S, *et al.*, (2017), From Blockchain Technology To Global Health Equity: Can Cryptocurrencies Finance Universal Health Coverage, *BMJ Glob Health*, 2, p. 1-6.
- Yue, X.; Wang, H.; Jin, D.; Li, M. and Jiang, W., (2016), Healthcare Data Gateways: Found Healthcare Intelligence on Blockchain with Novel Privacy Risk Control, *Mobile & Wireless Health*, 40:218, p. 1-8.