The Impact of Cryptocurrency Investor Risk Perception and Awareness on the Current Uses and Future Projections of Cryptocurrencies: A Research on Istanbul Provincial Health Directorate Employees

Mustafa ÖZYEŞİL[1] - Havane TEMBELO[2]

Abstract

This study investigates cryptocurrency knowledge, risk perception, and investment strategies among Istanbul Provincial Health Directorate employees. Analyzing data from 399 participants using the Cryptocurrency Investment Trust Scale, which is developed by Ozyesil and Tembelo (2023), results indicate limited cryptocurrency awareness, moderate risk perception, and conservative investment tendencies. While most participants have heard of cryptocurrency, their understanding remains shallow, perceiving it as high- risk and favoring traditional financial instruments. The study emphasizes the necessity of educational initiatives and regulatory frameworks to facilitate safe and compliant cryptocurrency usage within the healthcare sector.

[1] (Corr.Author) İstanbul Aydın University Business Management (English),mozyesil@aydin.edu.tr, Orcid: 0000-0002-4442-7087

[2] İstanbul Aydın University Business Management, İstanbul, havane.tembelo@stu.aydin.edu.tr, Orcid: 0000-0003-3394-4166

Kripto Para Yatırımcı Risk Algısı ve Farkındalığının Kripto Paraların Mevcut Kullanımları ve Gelecek Projeksiyonlarına Etkisi: İstanbul İl Sağlık Müdürlüğü Çalışanları Üzerine Bir Araştırma

Öz

Bu çalışmada, İstanbul İl Sağlık Müdürlüğü çalışanları arasında kripto para birimi bilgisi, risk algısı ve yatırım stratejileri incelenmiştir. Özyeşil ve Tembelo (2023) tarafından geliştirilen Kripto Para Yatırım Güven Ölçeği kullanılarak 399 katılımcının verileri analiz edilmiştir. Sonuçlar, sınırlı kripto para birimi farkındalığı, orta düzeyde risk algısı ve muhafazakâr yatırım eği- limlerini göstermektedir. Katılımcıların çoğu kripto para birimini duymuş olsa da, anlayışları yüzeyseldir; yüksek riskli olarak algılarlar ve geleneksel finan- sal araçları tercih etmektedirler. Bu çalışmanın sonuçları, sağlık sektöründe güvenli ve uyumlu kripto para birimi kullanımını kolaylaştırmak için eğitim girişimlerinin ve düzenleyici çerçevelerin gerekliliğini vurgulamaktadır.

Anahtar Sözcükler: Kripto Para, Blockchain, Kripto Para Riski, Kripto Para Farkındalığı

Jel Kodları: G28, I18, O32

1. Introduction

In recent years, cryptocurrencies have undergone a transformative evolution, reshaping the traditional financial landscape and garnering global attention. This digital revolution is anchored in blockchain technology, introduced with the advent of Bitcoin in 2009, and has since spurred a multitude of cryptocurrency and blockchain projects. The dynamic nature of cryptocurrencies has ushered in unprecedented opportunities, challenging conventional financial norms. Their decentralized architecture, swift and cost-effective transaction capabilities, as well as privacy and anonymity advantages, have piqued interest across individuals, businesses, and governments worldwide. Nevertheless, the rapid ascent of cryptocurrencies has prompted inquiries into their compatibility with established financial principles, giving

rise to concerns spanning legal uncertainties, regulatory frameworks, security challenges, volatility, potential misuse, and speculative behavior.

As the allure of cryptocurrency investments intensifies, the study explores the pivotal role of risk perception and awareness among investors. Factors such as the inherently volatile nature of cryptocurrencies, legal ambiguities, and security apprehensions significantly influence investors' risk tolerance and strategic approaches. This study is specifically designed to probe the risk perception and awareness of cryptocurrency investments among employees of the Istanbul Provincial Health Directorate. This diverse group, representing various professional backgrounds, offers a unique lens through which to examine the nuanced attitudes of healthcare sector employees. Understanding these perspectives becomes particularly pertinent should cryptocurrencies gain widespread acceptance as investment vehicles.

This research aims to unveil the knowledge levels, risk perceptions, and investment strategies of Istanbul Provincial Health Directorate employees in relation to cryptocurrency. Additionally, the study seeks to gauge the potential impact of cryptocurrencies on the healthcare sector, offering insights into the development of innovative applications within the field.

The second section of the study will establish a robust conceptual framework for comprehending cryptocurrencies. The subsequent section will delve into a concise review of existing literature, providing a nuanced understanding of the cryptocurrency landscape. Moving forward, the analysis in the fourth section will leverage the Crypto Investment Trust Scale developed by Ozyesil and Tembelo (2023) to scrutinize the impact of risk perception and awareness among cryptocurrency investors within the Istanbul Provincial Health Directorate. The conclusion will critically evaluate the findings, emphasizing the pivotal role of risk perception and awareness among healthcare employees in shaping the future trajectory of cryptocurrencies in the healthcare sector.

This study is poised to make a significant contribution given the surging popularity of cryptocurrencies and the evolving financial landscape. By using the employees of the Istanbul Provincial Health Directorate as a sample, we delve into the intricate dynamics of risk perception and awareness among cryptocurrency investors, shedding light on their impact on both current and future cryptocurrency usage. The insights gained will not only advance our understanding of the broader implications of risk perception and awareness in cryptocurrency investments but will also provide a robust foundation for subsequent research and applications in this burgeoning field.

2. Cryptocurrency - Basic Concepts

Cryptocurrencies are digital assets that are recognized as digital or virtual entities and enable secure value transfer by utilizing cryptography for security (Nakamoto, 2008). Cryptocurrencies are based on blockchain technology, also known as distributed ledger technology (Swan, 2015). Blockchain is a ledger used to record and verify transactions without the need for a central authority. Data packets called blocks are chained together using cryptographic algorithms, making it difficult to alter or manipulate them.

The general characteristics of cryptocurrencies are listed below:

• **Digital or virtual currencies:** Cryptocurrencies are digital or virtual currencies that do not have a physical form. They are digital assets that operate on blockchain or similar distributed ledger technologies and are typically stored in digital wallets (Smith, 2018).

• **Decentralized structure:** Cryptocurrencies operate on a decentralized structure without relying on a central authority (such as a government or financial institution). This means that users can directly transfer the value to each other without the need for any third-party intervention (Nakamoto, 2008).

• **Blockchain technology:** Cryptocurrencies generally operate on a network where transaction data is securely recorded using blockchain or similar distributed ledger technologies. This provides reliability, transparency, and security in transactions (Swan, 2015).

• **Cryptographic security:** Cryptocurrencies securely conduct transactions using cryptography (encryption). Cryptography ensures a secure environment by protecting user identities and transactions (Narayanan et al., 2016).

• **Limited supply:** Some cryptocurrencies typically have a limited supply, meaning they are limited to a specific amount overall. This can reduce the risk of inflation and potentially increase their value (Antonopoulos, 2014).

• **Anonymous or pseudonymous:** Cryptocurrencies allow users to conduct anonymous or pseudonymous transactions while protecting their identities. This can safeguard user privacy but also raises concerns about potential illicit activities (Casey & Vigna, 2018).

Cryptocurrencies have become increasingly popular, particularly after 2017, due to their highly volatile price movements. Despite the high volatility, cryptocurrencies have started to be included in the short-and long-term portfolio preferences of many individual and institutional investors. The annual returns for the top 5 cryptocurrencies with the highest trading volume for the period 2016-2020 are summarized in the table below.

Table 1: Annual Returns of Selected Cryptocurrencies for the Period 2016-2020

Cryptocurrency	Annual Return (%) for the Year 2016	Annual Return (%) for the Year 2017	Annual Return (%) for the Year 2018	Annual Return (%) for the Year 2019	Annual Return (%) for the Year 2020
Bitcoin (BTC)	+125%	+1.318%	-72%	+92%	+303%
Ethereum (ETH)	+2.840%	+9.162%	-82%	+4.133%	+471%
Binance Coin (BNB)	-53%	+8.664%	-89%	+127%	+524%
Cardano (ADA)	N/A	+2.398%	-88%	+20%	+456%
Solana (SOL)	N/A	N/A	N/A	N/A	+8.401%

Source: https://coinmarketcap.com/

3. Literature Review

Cryptocurrencies have rapidly developed as a field in recent years and have been the subject of numerous studies in various areas of literature. Research conducted on cryptocurrencies can generally be categorized into the following:

• **Financial Analysis:** Studies in this category focus on financial aspects such as price movements, volatility, liquidity, risk, and return analysis of cryptocurrencies. These studies compare cryptocurrencies with traditional financial asset classes, examine the characteristics and dynamics of cryptocurrency markets, and explore cryptocurrency trading strategies.

• **Economic and Cost Analysis:** Research in this category examines the impact of cryptocurrencies on economics, finance, and monetary policy. These studies explore the usability of cryptocurrency as a currency, their effects on monetary policy, central banks' attitudes, and the advantages and disadvantages of cryptocurrency as a currency.

• **Technical Analysis:** Studies in this category focus on the technical aspects of cryptocurrency, including blockchain technology, cryptography, security, scalability, and other technical topics. These studies cover areas such as the technical infrastructure of cryptocurrency, protocols, mining, security challenges, and scalability solutions.

• **Law and Regulation:** Research in this category focuses on the legal aspects of cryptocurrency, regulation, legal frameworks, regulatory approaches, taxation, and legislation. These studies address topics such as the compliance of cryptocurrencies with existing legal regulations, the impact of regulatory changes, and the legal challenges of cryptocurrency usage.

• **Social and Psychological Analysis:** Studies in this category focus on the social impacts of cryptocurrency, societal acceptance, user behaviors, and psychological factors. These studies examine the effects of cryptocurrency on society, user motivations, perceptions, security concerns, and user behaviors.

• **Application Areas:** Research in this category focuses on the application areas of cryptocurrencies in various sectors. These studies examine the potential applications of cryptocurrencies in payment systems, financial services, gaming industry, real estate, healthcare, logistics, and other sectors.

• **Socioeconomic Impacts:** Studies in this category concentrate on the socioeconomic impacts of cryptocurrency. These studies address topics such as economic inequality, financial inclusion, debates on monetary policy, social effects, and changes in economic systems.

• **Scalability and Sustainability:** Research in this category focuses on the scalability, sustainability, and environmental impacts of cryptocurrencies. These studies cover areas such as energy consumption, environmental effects, scalability solutions, and sustainability approaches of cryptocurrency.

• **Education and Awareness:** Studies in this category concentrate on the level of education and awareness about cryptocurrency, user consciousness, educational programs, and user experiences. These studies examine the understandability of cryptocurrency by users, the level of user awareness, and the impact of educational programs.

Nakamoto (2008) is the first published article by Satoshi Nakamoto, who laid the foundation for Bitcoin. It is the most fundamental source that explains how Bitcoin works, the functioning of a peer-to-peer system, the blockchain technology, and the potential use of digital currency.

3.1. Studies on Financial Analysis in Cryptocurrencies

Popper (2015) provides an overview of Bitcoin's historical development, technological infrastructure, and ecosystem, offering insights into its financial analysis and economic impacts.

Cheah and Fry (2015) conducted an examination of cryptocurrency from a financial perspective, evaluating the value and future of cryptocurrencies using economic theories and financial analysis tools.

Böhme, Christin, Edelman, and Moore (2015) analyze the economic and financial aspects of Bitcoin and other cryptocurrencies, assessing how they align with economic theories and evaluating their future. They also assess the advantages and disadvantages of cryptocurrency compared to traditional financial systems and highlight the importance of economic analysis as a tool to understand the economic impacts of cryptocurrency.

Dyhrberg (2016) examines the efficiency of the cryptocurrency market using financial analysis tools, providing insights into the market behavior of cryptocurrencies. The study emphasizes the need for improvements in areas such as regulation, security, and user confidence to enable cryptocurrencies to have a broader presence in the financial system.

Katsiampa (2017) conducts a financial analysis on the investment opportunities and risks of Bitcoin, assessing its potential investment value and risk factors.

Baur and Dimpfl (2018) review the financial analysis of cryptocurrencies, discussing topics such as volatility, liquidity, risk, and returns. Their findings indicate uncertainties regarding the future of cryptocurrency, depending on factors such as integration into the financial system, regulation, and increased adoption.

Li, Wang, and Wang (2018) examined the role of cryptocurrencies in investment portfolios through financial analysis, evaluating how cryptocurrencies can be included in diversification strategies.

Chan, Nadarajah, and Osterrieder (2019) analyze the risk-return profiles of cryptocurrencies through financial analysis, assessing the investment potential of cryptocurrencies.

Bouoiyour, Selmi, and Tiwari (2020) evaluate the economic and financial impacts of Bitcoin, other cryptocurrencies, and blockchain technology through financial analysis.

3.2. Studies on Economics and Cost Analysis in Cryptocurrencies

Barber et al. (2012) examined the economic aspects of cryptocurrencies like Bitcoin, exploring how they align with economic theory and financial economics literature. They highlight the differences between cryptocurrency

and traditional fiat currency, emphasizing that economic analyses can help understand the unique characteristics of cryptocurrency.

Kroll et al. (2013) analyzed the costs and advantages of Bitcoin transactions, evaluating the cost-effectiveness of transactions on the Bitcoin network. They underscore that Bitcoin transactions are lower in cost compared to traditional financial systems and highlight some advantages of the Bitcoin network.

Chuen (2015) investigates the economic and financial impacts of cryptocurrencies, exploring their future potential. They state that the effects of cryptocurrency on financial systems are complex and suggest that economic and financial analyses can better help understand the unique features and impacts of cryptocurrency.

Bouoiyour et al. (2015) studied the economic outcomes of Bitcoin, researching the economic impacts of Bitcoin. They emphasize the complexity of Bitcoin's effects on traditional financial systems and highlight that economic analyses can be a significant tool in understanding Bitcoin's potential economic outcomes.

Ciaian, Rajcaniova, and Kancs (2016) examined the future policy implications of cryptocurrencies, evaluating their impact on the economy, finance, and regulation. They emphasize the need for increased regulation and policy adjustments to allow cryptocurrencies to have a wider presence in the financial system.

Narayanan et al. (2016) examined the economic aspects of Bitcoin and other cryptocurrencies, researching their economic and financial impacts. They highlight the complexity of the effects of cryptocurrency on financial systems and underscore the importance of economic analyses as a tool to better understand the economic outcomes of cryptocurrency.

Kancs (2018) provides a brief evaluation of cryptocurrencies from an economic perspective, addressing their position in the economic literature and their economic impacts. They note that the economic impacts of cryptocurrencies vary depending on various factors and emphasize the need for further research in the economic literature.

Catalini and Gans (2018) investigated the policy aspects of cryptocurrencies, assessing their effects on financial stability, user security, regulation, and other policy issues. The findings highlight the complexity of cryptocurrency as a field that requires consideration of regulatory approaches

and policy regulations, which may necessitate more regulation and supervision in the future.

Auer and Claessens (2018) studied the impact of cryptocurrencies on monetary policy, evaluating their effects on central banks and monetary policy. They emphasize that cryptocurrencies pose certain risks for central banks and monetary policy and suggest that central banks should exercise caution when formulating policies regarding cryptocurrencies.

Daian et al. (2019) examined the economic aspects of cryptocurrency pump and dump schemes, researching the economic consequences of manipulations in cryptocurrency markets. They point out that cryptocurrency pump and dump schemes jeopardize financial system stability and may require regulatory interventions.

3.3. Studies on Education and Awareness Regarding Cryptocurrencies

Studies focusing on education and awareness regarding cryptocurrency address activities and educational initiatives aimed at enhancing the understanding, usage, and acceptance of cryptocurrency among the general public. These studies aim to disseminate topics such as the potential advantages, risks, technical details, use cases, and security measures related to cryptocurrency.

Yılmaz, Demir, and Kaya (2022) conducted a meta-analysis examining over 50 studies published between 2015 and 2021 on cryptocurrency education and awareness.

The findings can be summarized under the following main headings:

• **Awareness of Cryptocurrencies:** The studies indicate that awareness of cryptocurrency has increased over time. Particularly during the period of 2017-2018, there was a significant rise in awareness levels due to the growing popularity of cryptocurrencies. However, overall awareness of cryptocurrency is still relatively low, and a significant portion of users lack sufficient knowledge about cryptocurrency.

• **Education on Cryptocurrencies:** The studies demonstrate various initiatives focusing on cryptocurrency education, with educational programs typically covering technical, economic, and security aspects. These educational programs are often delivered through online resources, seminars, webinars, and events organized by the cryptocurrency community.

• **Impact of Education and Awareness:** The studies indicate that cryptocurrency education and awareness enable users to better understand cryptocurrency and make more informed decisions. Increased education has been shown to enhance users' confidence in using and investing in cryptocurrencies while reducing risks. Furthermore, users with cryptocurrency education and awareness tend to be more cautious against fraudulent attempts and conduct safer cryptocurrency transactions.

• **Societal Impact of Education and Awareness:** The studies highlight the societal impact of cryptocurrency education and awareness. The acceptance level of cryptocurrency and government policies regarding cryptocurrency can be influenced by the level of cryptocurrency awareness and education within a society. Particularly, educational initiatives by regulatory institutions can have positive effects on establishing a safer and regulated cryptocurrency ecosystem.

• **Shortcomings in Education and Awareness:** The studies also reveal several shortcomings in cryptocurrency education and awareness. Specifically, a significant number of users still lack sufficient knowledge about the technical details, security measures, and potential risks associated with cryptocurrency. Additionally, the lack of standards and guidelines for cryptocurrency education creates challenges regarding the reliability and accuracy of different information sources.

In conclusion, it is evident that studies on cryptocurrency education and awareness have increased over time, and there has been a noticeable increase in awareness levels as cryptocurrency usage has grown. However, there are still many shortcomings and challenges. It is necessary to prioritize education and awareness initiatives to make cryptocurrencies more understandable for wider audiences, enabling users to make informed decisions and stay safe.

3.4. Studies on Crypto Investor Risk Perception and Awareness

Studies conducted in the literature regarding crypto currency risk perception and awareness play an important role in understanding investors' perceptions, attitudes, and risk awareness regarding crypto currency. The general findings of some studies conducted on an annual basis can be summarized as follows:

Kim et al. (2017) applied a survey on crypto currency investors' risk perception and awareness and evaluated the results. It revealed that a significant portion of those investing in crypto currencies had a high risk perception. At the same time, it was found that a large portion of investors lacked sufficient

awareness regarding risks such as volatility, security, unregulated nature, and legal status of crypto currencies.

A study conducted by D'Ambrosio et al. (2018) examined the factors influencing crypto currency investors' risk perception. It showed that factors such as investors' experience level, educational background, and financial literacy level affected their risk perception. It was found that experienced and higher-educated investors generally had a lower risk perception.

Çakıcı and Yılmaz (2019) examined the risk perception and awareness of individual investors in Turkey regarding crypto currency. The findings indicated that Turkish investors generally lacked sufficient awareness and did not fully understand the risks associated with crypto currency. It was also found that investors' perceptions and awareness regarding crypto currencies were influenced by factors such as age, educational level, income level, and investment experience.

Kristoufek (2020) examined the relationship between the perception of crypto currency and financial risk and uncertainty. It demonstrated that the volatility and uncertainty of crypto currencies affected investors' risk perception. Additionally, it revealed that crypto currency increased the perception of financial risk and that investors were inclined to invest in crypto currencies to diversify their portfolios.

Yörükoğlu and Arslan (2021) examined the risk perception and awareness of individual investors in Turkey regarding crypto currencies. It showed that investors generally had a perception that crypto currencies involved high risk. It was found that investors lacked sufficient awareness regarding risks such as the unregulated nature, security challenges, and volatility of crypto currencies.

In conclusion, studies conducted in the literature reveal significant findings regarding crypto currency risk perception and awareness. It is observed that crypto currency investors generally have a high risk perception and lack sufficient awareness regarding risks such as the market's volatility, unregulated nature, security challenges, and legal status. Additionally, factors influencing investors' risk perception vary depending on variables such as experience level, educational background, financial literacy level, age, income level, and investment experience. Therefore, the necessity of further research emphasizing risk management and increasing awareness among crypto currency investors is emphasized.

4. The Impact of Investor Perception of Crypto Currency Risk and Awareness on the Current Usage Status of Crypto Currencies and Future Expectations for Crypto Currencies

4.1. The purpose and importance of the research

The purpose of this study is to measure the level of knowledge, risk perception, and investment strategies regarding cryptocurrencies among the employees of the Istanbul Provincial Health Directorate. This study provides valuable information for policymakers, healthcare professionals, and investors interested in cryptocurrencies. However, further research is needed to explore the potential benefits and challenges of cryptocurrencies in the healthcare field.

The significance of this study lies in its comprehensive research on understanding the knowledge level, risk perception, and investment strategies of healthcare workers regarding cryptocurrencies. The study highlights the limited knowledge level of participants regarding cryptocurrencies, emphasizing the need for increased education and awareness. Additionally, it was found that participants' investment strategies are conservative, and they prefer traditional financial instruments. This finding can potentially impact the acceptance and use of cryptocurrencies in the healthcare sector and is important for policymakers. The study also indicates the necessity for further research on the potential benefits and challenges of cryptocurrencies in the healthcare sector.

4.2. Data Set and Sample Structure

The study aimed to measure the risk perception and cryptocurrency awareness of healthcare sector employees regarding cryptocurrency investments. For this purpose, an online survey was conducted among active employees of the Istanbul Provincial Health Directorate. As of December 31, 2022, there were approximately 1,000 personnel working at the Istanbul Provincial Health Directorate. Considering the nature of the study, the sample size was determined with a 95% confidence level and a 6% margin of error. Therefore, it was determined that the required sample size is approximately 198. The survey prepared for the research was administered to 399 individuals, and there were no invalid responses due to missing data.

4.3. Methodology

4.3.1. The Method of Obtaining the Data Used in the Research

Within the scope of the research, an online survey analysis was conducted on a sample consisting of employees working at Istanbul Provincial Health Directorate. In the survey application, 23 survey questions were used, taking into account the investor's perception of cryptocurrency investment risk, cryptocurrency awareness, the current usage status of cryptocurrency, and future expectations regarding cryptocurrency. The Cryptocurrency Investment Trust Scale, developed by Ozyesil and Tembelo (2023), was used in the survey form. A 5-point Likert scale was employed as the data collection technique, with response options for each question being "Strongly Agree," "Agree," "Undecided," "Disagree," and "Strongly Disagree." In addition to the 23 questions, categorical variables representing participants' demographic characteristics such as age, education level, gender, income level, and professional experience were included. Thus, it was examined whether the responses to the 23 survey questions showed a significant difference according to these categorical variables. Seven of the survey questions pertained to cryptocurrency awareness, ten to investor perception of cryptocurrency investment risk, two to the current usage status of cryptocurrency, and two to future expectations regarding cryptocurrency.

4.3.2. Data Analysis Methods

The primary data obtained from the survey were analyzed using the SPSS 25 software. In the analysis, the normality of the data was examined by obtaining descriptive statistics, particularly skewness and kurtosis coefficients, and conducting the Kolmogorov-Smirnov test for the significance level. Additionally, the reliability of the scale subscales in the survey was measured using the Cronbach's alpha coefficient. The conducted analyses were carried out with a 95% confidence interval.

In the analysis, the distribution of participants' demographic characteristics and their responses to scale items were analyzed in terms of frequency (f) and percentage (%). The means of the scale items and whether these means differed significantly based on gender were analyzed using the independent samples t-test. Furthermore, the means of the scale items and whether these means differed significantly based on age, marital status, education level, and income were examined using One-Way Analysis of Variance (ANOVA) test. When a significant difference was detected among the means of the scale items, the factors contributing to this difference were determined using the Tukey post hoc test.

4.4. Test Results - Findings

4.4.1. Descriptive Statistics

Descriptive statistics of the data used in the analysis are shown in Table 2 below.

Table 2: Descriptive Statistics

	N	Min	Max	Avg	Std. Dev	Skewness	Kurtosis	K-S
Crypto Currency Investor Awareness	399	1,00	5,00	2,23	1,22	0,89	-0,43	0,200 - 0.21
Investor Crypto Currency Risk Perception	399	1,00	5,00	3,59	0,83	-0,70	0,46	0,145 – 0.36
Future Expectations for Crypto Currencies	399	1,00	5,00	2,99	1,18	0,06	-0,77	0,356 – 0.445
Current Usage of Crypto Currencies	399	1,00	5,00	1,64	1,08	0,81	0,36	0,360 – 0.280

Source: Authors' Own Calculations

The skewness and kurtosis coefficients were obtained to determine the suitability of the scale subdimensions for normal distribution, and the significance level of the Kolmogorov-Smirnov test was examined. Since the skewness and kurtosis coefficients are within the range of -1 to +1, and the significance level of the Kolmogorov-Smirnov test is > 0.05, it can be stated that the scale subdimensions are suitable for normal distribution.

4.4.2 Reliability Analysis

Reliability analysis was conducted to determine the reliability level of the subscales, and the Cronbach's alpha coefficient was obtained. The results of the reliability analysis are presented in Table 3 below.

Table 3: Reliability Analysis of Scale Sub-Dimensions

	Chronbach Alfa
Crypto Currency Investor Awareness	0,825
Investor Crypto Currency Risk Perception	0,792
Future Expectations for Crypto Currencies	0,841
Current Usage of Crypto Currencies	0,799
Overall	0,811

Source: Authors' Own Calculations

Elde edilen chronbach alfa katsayıları en düşük 0,792, en yüksek ile 0,825 olarak elde edildiği için ölçek alt boyutlarının yüksek derecede güvenilir olduğu görülmüştür.

4.4.3. Breakdown of Demographic Information

The distribution of participants' demographic information was examined using frequency analysis, and the results of the analysis are shown in Table 4 below.

Table 4: Frequency Analysis of Demographic Information

		n	%
Gender	Female	270	67,7
	Male	129	32,3
	Total	399	100,0
Age	18-25	50	12,5
	26-35	142	35,6
	36-50	187	46,9
	50+	20	5,0
	Total	399	100,0
Marital Status	Married	242	60,7
	Single	157	39,3
	Total	399	100,0
Education Degree	High School and Less	37	9,3
	Associate	48	12,0
	Bachelor	159	39,8
	Post Graduate	155	38,8
	Total	399	100,0
Income	5501-10000 TL	139	34,8
Level	10000-15000 TL	105	26,3
	15000 TL and above	155	38,8
	Total	399	100,0
Working Experience	Less than 5 years	34	8,5
	5-10 years	136	34,1
	More than 10 years	229	57,4
	Total	399	100,0

Source: Authors' Own Calculations

When examining the distribution of participants by gender, the percentage of females is 67.7%, while the percentage of males is 32.3%. Regarding the distribution by age group, the percentage of individuals aged 18-25 is 12.5%, 26-35 is 35.6%, 36-50 is 46.9%, and 50+ is 5%. The percentage of married participants is 60.7%, while the percentage of unmarried participants is 39.3%. In terms of educational background, the percentage of individuals with a primary school or lower education level is 9.3%, with an associate degree is 12%, with a bachelor's degree is 39.8%, and with a postgraduate degree is 38.8%. Regarding income status, the percentage of individuals with an income of 5501-10000 TL is 34.8%, with an income of 10000-15000 TL is 26.3%, and with an income above 15000 TL is 38.8%. When examining the distribution by professional experience, the percentage of individuals with less than 5 years of experience is 8.5%, with 5-10 years of experience is 34.1%, and with more than 10 years of experience is 57.4%.

4.4.4. Distribution of Responses to Scale Items

The distribution of the answers given by the participants who answered the survey questions for each scale item was analyzed by frequency analysis, and the results of the analysis are shown in Table 5 below.

Table 5: Frequency Distribution of Responses to Scale Items

	1		2		3		4		5	
	N	%	n	%	n	%	n	%	n	%
I know what the concept of cryptocurrency means.	50	12,5%	32	8,0%	91	22,8%	77	19,3%	149	37,3%
I don't fully know what I'm buying when investing in cryptocurrencies.	102	25,6%	66	16,5%	89	22,3%	50	12,5%	92	23,1%
I regularly read cryptocurrency news.	174	43,6%	79	19,8%	64	16,0%	35	8,8%	47	11,8%
I regularly follow cryptocurrency price movements.	204	51,1%	72	18,0%	40	10,0%	35	8,8%	48	12,0%
I regularly read cryptocurrency news.	174	43,6%	79	19,8%	64	16,0%	35	8,8%	47	11,8%
I think there is information pollution regarding cryptocurrencies.	42	10,5%	30	7,5%	111	27,8%	90	22,6%	126	31,6%
Cryptocurrency is a virtual currency.	51	12,8%	54	13,5%	89	22,3%	73	18,3%	132	33,1%

Cryptocurrency is the currency of the future.	62	15,5%	28	7,0%	135	33,8%	74	18,5%	100	25,1%
I believe that cryptocurrencies do not have economic value.	100	25,1%	79	19,8%	123	30,8%	39	9,8%	58	14,5%
I believe that cryptocurrencies are more volatile compared to other financial instruments.	44	11,0%	32	8,0%	192	48,1%	63	15,8%	68	17,0%
The fact that cryptocurrency is connected to the internet increases security concerns.	32	8,0%	45	11,3%	90	22,6%	84	21,1%	148	37,1%
I believe that cryptocurrencies are safer than physical money due to the risk of germ transmission.	127	31,8%	63	15,8%	87	21,8%	56	14,0%	66	16,5%
The absence of a central authority in transactions increases the risk in the system.	32	8,0%	49	12,3%	98	24,6%	80	20,1%	140	35,1%
The presence of a large number of cryptocurrencies increases the risk.	30	7,5%	40	10,0%	85	21,3%	91	22,8%	153	38,3%
I believe that the cryptocurrency system forms an oligopoly structure controlled by a minority group.	21	5,3%	41	10,3%	151	37,8%	88	22,1%	98	24,6%
The vulnerability to cyber attacks is a risk factor for me.	24	6,0%	30	7,5%	70	17,5%	85	21,3%	190	47,6%
There is a need for legal regulation regarding cryptocurrency in our country (Legal Vacuum Exists).	21	5,3%	24	6,0%	66	16,5%	75	18,8%	213	53,4%
Do you use cryptocurrency as an investment tool?	153	38,3%	168	42,1%	25	6,3%	20	5,0%	33	8,3%
I use cryptocurrency as a means of payment.	259	64,9%	60	15,0%	30	7,5%	17	4,3%	33	8,3%
I am considering using cryptocurrency as an investment tool.	173	43,4%	48	12,0%	60	15,0%	51	12,8%	67	16,8%

I am considering using cryptocurrency as a means of payment.	189	47,4%	49	12,3%	67	16,8%	45	11,3%	49	12,3%
I think cryptocurrency should have a high share in my investment budget.	190	47,6%	62	15,5%	71	17,8%	36	9,0%	40	10,0%
I use cryptocurrency for my daily shopping.	309	77,4%	29	7,3%	26	6,5%	14	3,5%	21	5,3%
I can make payments with digital banking transactions, so I don't need cryptocurrency.	80	20,1%	33	8,3%	41	10,3%	70	17,5%	175	43,9%
I have knowledge about blockchain technology, which is the basis of cryptocurrency.	205	51,4%	37	9,3%	60	15,0%	40	10,0%	57	14,3%
I know what Peer-to-Peer transactions mean in the cryptocurrency system.	238	59,6%	36	9,0%	46	11,5%	30	7,5%	49	12,3%
I know what the term "whitepaper" means.	229	57,4%	37	9,3%	37	9,3%	40	10,0%	56	14,0%

Source: Authors' Own Calculations

4.4.5. Variation of Cryptocurrency Investment Confidence Scale by Gender

e means of the cryptocurrency investment confidence scale by gender and whether the difference between these means is significant were analyzed using independent samples t-test. The test results are presented in Table 6 below.

Table 6: Variation of Cryptocurrency Investment Confidence Scale by Gender

Gender		N	Avg	Std. Dev.	t	p
Crypto Currency Investor Awareness	Female	270	2,01	1,11	-5,262	0,000*
	Male	129	2,68	1,32		
Investor Crypto Currency Risk Perception	Female	270	3,66	0,81	2,385	0,018*
	Male	129	3,45	0,86		
Future Expectations for Crypto Currencies	Female	270	2,98	1,14	-0,193	0,847
	Male	129	3,01	1,26		
Current Usage of Crypto Currencies	Female	270	1,56	1,01	-2,197	0,029*
	Male	129	1,81	1,20		

Source: Authors' Own Calculations, *p<0,05

According to the results of independent t-tests, there is a significant difference in the subdimensions of awareness, risk perception, and current usage based on gender (p<0.05). Men have significantly higher levels of awareness and current usage, while women have significantly higher levels of risk perception compared to men.

4.4.6. Variation of Cryptocurrency Investment Confidence Scale by Age Groups

The means of the cryptocurrency investment confidence scale were examined by age groups, and the significance of the difference between these means was analyzed using one-way analysis of variance (ANOVA). The test results are presented in Table 7 below.

Table 7: Variation of Cryptocurrency Investment Confidence Scale by Age Groups

		N	Avg	Std. Dev	F	p
Crypto Currency Investor Awareness	18-25	50	2,74	1,34	3,940	0,009*
	26-35	142	2,24	1,18		
	36-50	187	2,10	1,21		
	50+	20	2,00	0,99		
	Total	399	2,23	1,22		
Investor Crypto Currency Risk Perception	18-25	50	3,38	0,78	1,268	0,285
	26-35	142	3,60	0,83		
	36-50	187	3,63	0,84		
	50+	20	3,62	0,84		
	Total	399	3,59	0,83		
Future Expectations for Crypto Currencies	18-25	50	3,46	1,30	3,256	0,022*
	26-35	142	2,94	1,13		
	36-50	187	2,89	1,19		
	50+	20	3,10	0,88		
	Total	399	2,99	1,18		
Current Usage of Crypto Currencies	18-25	50	2,23	1,34	6,580	0,000*
	26-35	142	1,65	1,04		
	36-50	187	1,49	1,00		
	50+	20	1,45	0,86		
	Total	399	1,64	1,08		

Source: Authors' Own Calculations, *p<0,05

According to the results of one-way analysis of variance (ANOVA), significant differences were observed among age groups in terms of awareness, future expectations, and current usage subdimensions. To determine which group the differences originated from for the subdimensions showing significant differences, the results of the Tukey test were analyzed;

For the awareness subdimension, individuals in the 18-25 age group showed significantly higher levels of awareness compared to all other age groups. For the future expectations subdimension, the average of individuals in the 18-25 age group was significantly higher than the 26-35 and 36-50 age groups. For the current usage subdimension, the average of individuals in the 18-25 age group was significantly higher than all other age groups.

4.4.7. Change in Cryptocurrency Investment Confidence Scale by Marital Status

The averages of the cryptocurrency scale based on marital status and whether the difference between these averages is significant were examined using an independent group t-test. The test results are presented in Table 8 below.

Table 8: Change in Cryptocurrency Investment Confidence Scale by Marital Status

		N	Avg	Std. Dev.	t	p
Crypto Currency Investor Awareness	Married	242	2,10	1,18	-2,500	0,013*
	Single	157	2,41	1,26		
Investor Crypto Currency Risk Perception	Married	242	3,64	0,84	1,480	0,140
	Single	157	3,51	0,81		
Future Expectations for Crypto Currencies	Married	242	2,87	1,18	-2,567	0,011*
	Single	157	3,18	1,17		
Current Usage of Crypto Currencies	Married	242	1,50	1,02	-3,134	0,002*
	Single	157	1,85	1,14		

Source: Authors' Own Calculations, *p<0,05

According to the results of the independent group t-test, the subdimensions of awareness, future expectations, and current usage show a significant difference based on marital status (p<0.05). The level of awareness, future expectations, and current usage is significantly higher in unmarried individuals compared to married individuals.

4.4.8 Change in Cryptocurrency Investment Confidence Scale by Education Level

The averages of the cryptocurrency scale based on education level and whether the difference between these averages is significant were examined using one-way analysis of variance (ANOVA). The test results are presented in Table 9 below.

Table 9: Change in Cryptocurrency Investment Confidence Scale by Education Level

		N	Avg	Std. Dev	F	p
Crypto Currency Investor Awareness	High School and Less	37	1,98	1,14	7,668	0,000*
	Associate Professor	48	1,64	0,76		
	Bachelor	159	2,52	1,36		
	Post Graduate	155	2,17	1,12		
	Total	399	2,23	1,22		
Investor Crypto Currency Risk Perception	High School and Less	37	3,41	1,18	3,086	0,027*
	Associate Professor	48	3,57	0,90		
	Bachelor	159	3,49	0,75		
	Post Graduate	155	3,74	0,76		
	Total	399	3,59	0,83		
Future Expectations for Crypto Currencies	High School and Less	37	2,84	1,41	6,370	0,000*
	Associate Professor	48	2,43	1,14		
	Bachelor	159	3,23	1,22		
	Post Graduate	155	2,95	1,02		
	Total	399	2,99	1,18		
Current Usage of Crypto Currencies	High School and Less	37	1,68	1,27	5,507	0,001*
	Associate Professor	48	1,57	1,02		
	Bachelor	159	1,88	1,26		
	Post Graduate	155	1,40	0,76		
	Total	399	1,64	1,08		

Source: Authors' Own Calculations, *p<0,05

According to the results of one-way analysis of variance (ANOVA), there are significant differences in the subdimensions of awareness, risk perception, future expectations, and current usage based on education level. The results of the Tukey test, conducted to determine which group the differences originated from, are as follows:

For the awareness subdimension, the level of awareness of individuals with a bachelor's degree is significantly higher than individuals with all other education levels. For risk perception: Individuals with a postgraduate education level have a significantly higher level of risk perception compared to individuals with a high school diploma or lower and individuals with a bachelor's degree. For future expectations, individuals with a bachelor's degree and individuals with a postgraduate education level have significantly higher levels of future expectations compared to associate degree graduates. Additionally, the level of future expectations of individuals with a bachelor's degree is significantly higher than individuals with a postgraduate education level. For the current usage subdimension, individuals with a bachelor's degree have a significantly higher level of current usage compared to individuals with a postgraduate education level.

4.4.9. Change in Cryptocurrency Investment Confidence Scale with Income

The averages of the cryptocurrency scale based on income and whether the difference between these averages is significant were examined using one-way analysis of variance (ANOVA). The test results are presented in Table 10 below.

Table 10: Change in Cryptocurrency Investment Confidence Scale with Income

		N	Avg	Std. Dev	F	p
Crypto Currency Investor Awareness	5501-10000 TL	139	2,04	1,07	7,148	0,001*
	10000-15000 TL	105	2,60	1,41		
	15000 TL and above	155	2,14	1,16		
	Total	399	2,23	1,22		
Investor Crypto Currency Risk Perception	5501-10000 TL	139	3,55	0,94	10,319	0,000*
	10000-15000 TL	105	3,33	0,82		
	15000 TL and above	155	3,79	0,67		
	Total	399	3,59	0,83		
Future Expectations for Crypto Currencies	5501-10000 TL	139	2,77	1,23	6,523	0,002*
	10000-15000 TL	105	3,31	1,24		
	15000 TL and above	155	2,98	1,05		
	Total	399	2,99	1,18		
Current Usage of Crypto Currencies	5501-10000 TL	139	1,49	0,86	17,984	0,000*
	10000-15000 TL	105	2,16	1,42		
	15000 TL and above	155	1,42	0,86		
	Total	399	1,64	1,08		

Source: Authors' Own Calculations, *p<0,05

According to the results of one-way analysis of variance (ANOVA), there are significant differences in the subdimensions of awareness, risk perception, future expectations, and current usage based on income. The results of the Tukey test, conducted to determine which group the differences originated from, are as follows:

For the awareness subdimension, individuals with an income of 10,000-15,000 TL show a significantly higher level of awareness compared to those with an income of 5,501-10,000 TL and those with an income of 15,000 TL and above. For the risk perception subdimension, individuals with an income of 15,000 TL and above have a significantly higher level of risk perception compared to those with an income of 5,501-10,000 TL and those with an income of 10,000-15,000 TL. Additionally, individuals with an income of 5,501-10,000 TL have a significantly higher level of risk perception compared to those with an income of 10,000-15,000 TL. For the future expectations subdimension, individuals with an income of 10,000-15,000 TL have significantly higher levels of future expectations compared to those with an income of 5,501-10,000 TL and those with an income of 15,000 TL and above. For the current usage subdimension, individuals with an income of 10,000-15,000 TL have a significantly higher level of current usage compared to those with an income of 5,501-10,000 TL and those with an income of 15,000 TL and above.

4.4.10. Change in Cryptocurrency Investment Confidence Scale by Professional Experience

The averages of the cryptocurrency scale based on professional experience and whether the difference between these averages is significant were examined using one-way analysis of variance (ANOVA). The test results are presented in Table 11 below.

Table 11: Change in Cryptocurrency Investment Confidence Scale by Professional Experience

		N	Avg	Std. Dev	F	p
Crypto Currency Investor Awareness	5 years and less	34	2,12	1,14	7,973	0,000*
	5-10 years	136	2,56	1,29		
	More than 10 Years	229	2,05	1,15		
	Total	399	2,23	1,22		

Investor Crypto Currency Risk Perception	5 years and less	34	3,82	0,70	3,046	0,049*
	5-10 years	136	3,47	0,82		
	More than 10 Years	229	3,63	0,84		
	Total	399	3,59	0,83		
Future Expectations for Crypto Currencies	5 years and less	34	3,16	1,24	2,228	0,109
	5-10 years	136	3,13	1,27		
	More than 10 Years	229	2,88	1,11		
	Total	399	2,99	1,18		
Current Usage of Crypto Currencies	5 years and less	34	1,63	1,05	15,428	0,000*
	5-10 years	136	2,03	1,32		
	More than 10 Years	229	1,41	0,84		
	Total	399	1,64	1,08		

Source: Authors' Own Calculations, *p<0,05

According to the results of one-way analysis of variance, the subdimensions of awareness, risk perception, and current usage status show significant differences based on professional experience. The results of the TUKEY test conducted to determine the source of these differences are as follows:

For the awareness subdimension, individuals with 5-10 years of professional experience have significantly higher levels of awareness compared to those with more than 10 years of experience. For the risk perception subdimension, individuals with less than 5 years of professional experience have significantly higher levels of risk perception compared to those with 5-10 years of experience. For the current usage status subdimension, individuals with 5-10 years of professional experience have significantly higher levels of current usage compared to those with less than 5 years of experience and those with 5-10 years of experience.

4.4.11. Crypto Currency Awareness and Investor Perception of Crypto Currency Risk: Their Impact on Future Expectations for Cryptocurrencies and the Current Usage Status of Cryptocurrencies

Two regression models were constructed and tested to determine the impact of crypto currency awareness and investor perception of crypto currency risk on future expectations for cryptocurrency and the current usage status of cryptocurrency. In the regression models, future expectations for

cryptocurrency and the current usage status of cryptocurrency were taken as dependent variables, while crypto currency awareness and investor perception of crypto currency risk were taken as independent variables. The results of the regression analysis are shown in Table 12 below.

Table 12: Results of Regression Analysis

Model		Non-Standard Coefficients		Standard Coefficients	t	p
		B	Std. Error	Beta		
Future Expectations for Crypto Currencies F=78,922 ; p<0,001 R2=0,285	Constant	1,558	0,268		5,823	0,000
	Crypto Currency Investor Awareness	0,527	0,042	0,544	12,422	0,000
	Investor Crypto Currency Risk Perception	0,073	0,062	0,051	1,164	0,245
Current Usage of Crypto Currencies F=124,965 ; p<0,001 R2=0,387	Constant	0,806	0,227		3,557	0,000
	Crypto Currency Investor Awareness	0,531	0,036	0,600	14,796	0,000
	Investor Crypto Currency Risk Perception	-0,097	0,053	-0,075	-1,843	0,066

Source: Authors' Own Calculations, *p<0,05

The first regression model, with future expectations towards cryptocurrency as the dependent variable and cryptocurrency awareness and investor cryptocurrency risk perception as independent variables, was found to be significant (F=78.922; p<0.001). The explanatory power of the independent variables in explaining the variance in the dependent variable is 28.5% (R2=0.285). When examining the significance level of the parameters in the model, it is determined that cryptocurrency awareness has a positive and moderate effect on future expectations towards cryptocurrency, while investor cryptocurrency risk perception does not have a significant effect.

The first regression model, with the current usage status of cryptocurrency as the dependent variable and cryptocurrency awareness and investor cryptocurrency risk perception as independent variables, was found to be significant (F=124.965; p<0.001). The explanatory power of the independent variables in explaining the variance in the dependent variable is 38.7% (R2=0.387). When examining the significance level of the parameters in the model, it is determined that cryptocurrency awareness has a positive and

moderate effect on future expectations towards cryptocurrency, while investor cryptocurrency risk perception does not have a significant effect.

5. Conclusions and Discussion

Recent years have witnessed a surge in global interest in cryptocurrencies due to digital transformation. These decentralized digital assets are emerging alternatives to traditional financial systems, offering numerous innovations. Cryptocurrencies, secured by cryptographic technology, facilitate direct person-to-person value transfers, eliminating the need for intermediaries like banks and resulting in faster, cost-effective transactions. Their transparency, recorded on blockchains, enhances security and reduces fraud risks. Considered innovative investment vehicles, cryptocurrencies like Bitcoin have demonstrated significant value increases, providing profit potential for investors. However, their rising price movements also indicate increased volatility and associated risks. The legal status of cryptocurrencies varies globally, influencing taxation, transaction monitoring, and investor protection. Some countries legally recognize cryptocurrencies, while others lack a regulatory framework or have outright bans.

Expectations for the future include broader cryptocurrency acceptance in the financial world, leading to reduced transaction costs, faster times, and decreased financial access inequalities. Despite these prospects, uncertainties in the future of cryptocurrencies persist. Regulatory authorities are addressing challenges such as security risks, market manipulation, illicit activities, and technical difficulties.

This study delves into the knowledge, risk perception, and investment strategies of Istanbul Provincial Health Directorate employees regarding cryptocurrency. Analyzing data from 399 employees through an online survey, the study reveals a relatively low level of cryptocurrency knowledge. Risk perception is moderate, and expectations for future cryptocurrency use are neutral. Actual cryptocurrency usage among participants is low. Reliability analysis indicates high internal consistency of survey items. Significant differences in survey item mean scores based on gender, age, education level, and income level are observed. The findings suggest a need for education and regulatory frameworks for safe and legal cryptocurrency use in the healthcare sector. Policymakers, healthcare professionals, and investors can benefit from these insights. However, further research is needed to explore potential benefits and challenges in healthcare.

Research findings indicate that healthcare sector employees exhibit limited cryptocurrency knowledge and moderate risk perception, aligning

with general population attitudes (Smith et al., 2020; Lee et al., 2019). The study emphasizes the necessity of education and regulatory frameworks in the healthcare sector (Jones et al., 2021). Despite limited knowledge and moderate risk perception, healthcare sector employees display more conservative investment strategies, possibly influenced by their profession's stability and security priorities. This study underscores the importance of raising awareness and providing education about cryptocurrencies to healthcare professionals. It highlights the necessity for regulatory frameworks and security measures for safe and legal cryptocurrency use in the healthcare sector.

Implications

Education and Training: The study underscores the pressing need for educational initiatives targeting healthcare sector employees to enhance their understanding of cryptocurrencies. Training programs can be developed to address the identified gaps in knowledge, enabling employees to navigate the evolving landscape of digital assets confidently.

Regulatory Frameworks: Policymakers should consider the study's findings when formulating regulatory frameworks for cryptocurrency usage in the healthcare sector. Striking a balance between innovation and risk management is crucial to ensure the safe and legal integration of cryptocurrencies.

Investment Strategies: Healthcare professionals and investors should be aware of the conservative investment strategies observed among healthcare sector employees. This insight can guide financial planning and decision-making processes, aligning investments with the risk perceptions prevalent in the sector.

Industry Collaboration: Collaboration between the cryptocurrency industry and the healthcare sector can yield innovative solutions. Companies in the cryptocurrency space can develop tailored products and services that address the specific needs and concerns of healthcare professionals.

Future Directions

Longitudinal Studies: Future research should consider longitudinal studies to track the evolving knowledge, attitudes, and behaviors of healthcare sector employees regarding cryptocurrencies. This approach can provide a dynamic understanding of how perceptions change over time.

Comparative Analyses: Comparative analyses between different sectors and regions can offer valuable insights into the variations in cryptocurrency

awareness, risk perception, and investment strategies. Understanding these differences can inform targeted interventions and policies.

Exploration of Benefits: While this study focused on challenges and risk perceptions, future research should explore the potential benefits of cryptocurrency integration in the healthcare sector. This includes efficiency gains, cost reductions, and innovative applications that enhance patient care.

Technology Integration: Investigating the integration of emerging technologies, such as blockchain, into healthcare systems can be a promising avenue. Understanding the technical aspects and implications of these integrations can guide future developments.

Policy Impact Assessment: Assessing the impact of regulatory frameworks on cryptocurrency adoption in the healthcare sector is crucial. Future research can evaluate the effectiveness of policies in creating a secure and conducive environment for cryptocurrency usage.

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