

CRYPTOCURRENCY TRADING AS A BEHAVIORAL ADDICTION: A CASE REPORT

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INTRODUCTION

Cryptocurrency, or crypto, is a digital medium of exchange used as a virtual currency. It is an innovative financial instrument that its ownership is secured by a digital ledger by using cryptography. In this sense, the first cryptocurrency that released as an open source software was bitcoin, which was introduced in 2009. Since 2011, cryptocurrencies besides bitcoin (altcoin) have been put into use. Over the years, it has become a financial product traded by millions of people. A study conducted in 2020 shows that approximately 16% of Turkey's population has traded cryptocurrencies, and in this sense, it ranks fourth in the world (Buchholz 2021).

Studies show that investing behavior can become gambling-like over time. Arthur et al. state that there is a spectrum between gambling and investing, and that those who buy and sell risky assets that are volatile in price can develop behaviors similar to those who gamble (Arthur et al. 2016). On the other hand, it has been stated that individuals who are more impulsive and stimulus-seeking and those who gamble regularly have a special interest in cryptocurrency trading (Delfabbro et al. 2021).

Cryptocurrencies can have quite volatile price fluctuations, and sometimes it bears the risk of having to lose all of the initial capital, thus, they have a higher financial risk than traditional stock markets and commodities. In this case report, a case of a cryptocurrency trader who meets the diagnostic criteria for gambling disorder according to DSM-5 is presented, and its clinical features are discussed in the light of literature data.

Informed consent was obtained from the individual included in this study.

CASE

B.U.B, 30-year-old male, research assistant at a university. Divorced, has 1 child. He has no chronic diseases in his medical history. In his psychiatric history, he received treatment for alcohol and substance use (ecstasy and cannabis) several years ago. He admits to psychiatry outpatient clinic with low mood, loss of motivation, and a desire to quit alcohol.

During the last months, he describes loss of pleasure, reluctance, desire to cry, irritability, and loss of appetite. He drinks alcohol almost every day to reduce his complaints. He consumes about 10 standard drinks of beer everyday. He states that he usually drinks with his friends, sometimes starting from noon until the evening. He also describes sweating, heart palpitations, restlessness, and anticipation anxiety. He states that he could not do his research due to his complaints and his academic performance decreased.

He started to drink alcohol regularly after a divorce a few years ago. He started with 1-2 standard drinks a day, beer, and increased to 10 a day over time. He states that he also engaged with the cryptocurrency trading at about the same time, and that he drinks alcohol while trading. He first started with bitcoin and expanded his portfolio by buying 20-25 altcoins in a short time. After about 3 months, he started to trade margins. He states that he was using 3 to 5 leverage at the beginning, he went up to 125 leverage in a short time, and he traded with 40 leverage on average. He says that he doesn't use stop-loss in leveraged trades. He spends almost every day tracking the prices of cryptocurrencies in front of his PC, he always takes his computer with him when he needs to go somewhere, he eats his dinner in front of his computer.

Although he traded in small amounts initially, after a few months he put more than 2 years' worth of his salary and lost almost all of it, adding more money as he lost. He finds it thrilling to earn the same amount of money as he earns by working for months with high leverage in minutes. He states that he feels the need to trade more in order to achieve the pleasurable feelings he desire. After continuous losses, he tried to control or stop trading, but he felt restless and angry, and his mind was constantly on cryptocurrency prices when he was not trading. He sometimes traded to reduce the distress and uneasiness. Shortly after he started trading margins, trading started to take a significant part of his time, so the time he spent on his work was reduced, and his interest in his hobbies decreased. He says that he had to lie to his relatives because of his trades and losses, and that he needed others to provide financial resources because of the money he lost.

Since he experiences intense anxiety in trades with high leverage, he drinks alcohol before the trade. He

states that he can take action more easily when he suppresses his anxiety.

In the past, he spent a lot of time in the casino when he went abroad. He did not attend to a congress, which he went to for educational purposes, and spent his time in the casino.

In his physical examination, there were no significant findings other than mild tremor. In his mental state examination, he was conscious, cooperative and oriented to time and space, his affect was mildly anxious, depressive themes were dominant in his thought content, there was no suicidal-homicidal thought, and he wasn't showing any abnormalities in his perception.

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- Clinical Institute Withdrawal Assessment for Alcohol Scale – 8/67;
- Beck anxiety scale: 22 points (moderate anxiety);
- Beck depression scale 38 points (severe depression);
- South oaks gambling screening test: 11 points (possible gambler);
- Pathological trading scale: 12 points (possible pathological trading);
- Barratt impulsivity scale: planning impulsivity 10 points, motor impulsivity 18 points, attention impulsivity 14 points;
- CBC and blood work: Normal;
- ECG: Sinus rhythm.

Cognitive-behavioral treatment (CBT), sertraline and acamprosate were planned for alcohol use disorder, gambling disorder and comorbid anxiety and depressive disorders. Acamprosate 3x1 was started as 333 mg and increased to 3x2 with weekly follow-ups. Sertraline was started at 25 mg and increased to 50 mg in the follow-ups.



High risk situations: tracking the prices of cryptocurrencies more than 20 times a day, watching news about cryptocurrencies, engaging with cryptocurrency social media groups, trying to make up with previous losses

Figure 1. Pathological trading cycle

In the first 3 sessions of psychotherapy, psychoeducation was given, the cognitive-behavioral model was elucidated, a motivational interview was conducted, and treatment goals were determined. The main treatment goal was determined as cessation of pathological trading activity and alcohol use. Pathological trading behavior was formulated based on the “gambling cycle” proposed by Ladouceur et al. (2001) (Figure 1).

The treatment plan was created within the framework suggested by Petry et al., as restriction of behaviors leading to pathological trading, identification of dysfunctional thoughts and cognitive restructuring, stress management, detection and prevention of risky situations that may lead to relapse after treatment (Petry & Roll 2001). In this context, in the 4th interview, he was asked to create an activity diary and note trade transactions. Maladaptive behaviors such as carrying his computer with him continuously, tracking the cryptocurrency values very often during the day, drinking alcohol during trading were detected and restricted. In the 5th and 6th interviews, it was found out that he followed the value of cryptocurrencies hundreds of times during the day on the computer, took instant impulsive transactions with a fear of missing out, tried to reduce the anxiety that caused by using high leverage in trading with alcohol, thus he became insensitive to loss and did not use stop-loss function in trading, resulting to lose a significant amount of money. The underlying thoughts that led to these behaviors were determined and alternative thoughts were created (e.g. “if I do not enter the trade immediately, I will miss a great opportunity”, “even if it goes up 1% from here, I can double my money with 100 leverage”, “I may never get this opportunity again”).

At the 7th interview, it was found out that there was a 50% decrease in the amount of intraday trades and the time spent, a 19-point decrease in the Beck Depression Inventory and an 11-point decrease in the Beck Anxiety Inventory. He was not drinking alcohol during trading and his weekly alcohol intake had fallen to 10 standard drinks; the CIWA score was 1. In the 8th interview, within the stress management, relaxation techniques were explained, activity planning was applied and daily exercise programme was arranged. CBT was continued with two more interviews including cognitive restructuring. Several thought errors were identified and alternative to these thoughts were created; e.g illusion of control, fear of missing out, gambler's fallacy, selective attention and rationalization.

In the 10th interview, his alcohol intake was zero, his depression and anxiety was mild, and the frequency of intraday trading behavior decreased by 90% (CIWA-Ar: 0, Beck depression scale: 7, Beck anxiety scale: 3). In the last interview, high-risk situations were determined and warning signs that indicate a relapse were listed and the precautions to be taken in those instances were determined. Medical treatment was continued with monthly follow-ups for 6 months.

Table 1. Economic terms used in the text

Margin trading	Margin trading is the type of trading that allows the person to trade on the leverage he/she chooses. The amount traded in the margin trade is borrowed from the brokerage, and when it is closed, the payment is made with the interest.
Stop-loss	It is an order type given to sell securities, coins or shares in the stock market when they reach a certain price. The purpose of stop-losses is to prevent traders from losing money as much as possible, that is, to minimize a possible loss.
Leverage	It is a financial tool that allows the person to make large trades with little capital. In trading margins, trades can be made at the rate of leverage of the amount traded, loss or profit is realized at the rate of leverage (e.g 5 times profit or loss when used 5 times leverage)

DISCUSSION

In this case report, a cryptocurrency trader who meets the diagnostic criteria of depression and generalized anxiety disorder as well as alcohol use disorder and gambling disorder is presented. In his history, it is seen that he started to trade with a small number of cryptocurrencies in the beginning, increased this amount in a short time, and after starting margin trading with high leverage, his financial loss began to increase and he started to develop psychiatric symptoms (Table 1).

Investing and gambling behavior can occasionally be intertwined. Although investment is not equivalent to gambling, it is stated that some people can gamble with their investments (Grall-Bronnec et al. 2017). It has been suggested that on the spectrum between investing and gambling, instruments closer to gambling are speculative assets whose value fluctuate frequently (Arthur et al. 2015, Grall-Bronnec et al. 2017). In the study conducted by Sonkurt and Altınöz with cryptocurrency investors, it was determined that more impulsive individuals, short-term traders, those who frequently track the value of cryptocurrencies and those who trade margins are more prone to trade pathologically (Sonkurt & Altınöz 2021). The fact that the presented case has a history of gambling may indicate that his involvement with cryptocurrencies was risky from the beginning. In the study of Mills and Nower in 2019, it was found that regular gamblers are particularly interested in cryptocurrencies, and individuals with gambling disorder who trade both cryptocurrencies and high-risk stocks show signs of depression and anxiety disorder at a high rate (Mills & Nower 2019). In this sense, the trading behavior and comorbid psychiatric disorders of the presented case is similar to those stated in the literature.

The rapid change in value over time makes cryptocurrencies attractive for individuals with high risk-seeking behaviors (Mills & Nower 2019). Unlike traditional exchanges, the fact that trading is open 24/7 also increases the preoccupation of crypto traders. With these aspects, Griffiths mentions "crypto trading addiction" as a sub-form of gambling disorder (Griffiths 2018). A study of stock traders in France found that frequent traders, had small gains at first, followed by losses, continuous trades to make up for losses,

decreased control over money over time, and they develop several cognitive errors such as selective attention, gambler's fallacy and rationalization, similar to individuals with gambling disorder (Grall-Bronnec et al. 2017). In the presented case, he experiences small amounts of gains, followed by larger amounts of losses, and by chasing losses he starts to lose even more. Thus, he experiences a similar process to a typical gambling disorder onset. The risk further increases when he starts to trade with high leverage. The behavior of suppressing anxiety with alcohol, which can be seen as a normal process in order to cope with this risk, further reduces cognitive control and acts as a reinforcer for pathological behaviors.

In a study conducted with excessive stock traders, Markiewicz et al. stated that the main motivation in day-trading is the pursuit of positive stimuli such as pleasure, rather than investment (Markiewicz & Weber 2013). In the presented case, the pleasure that he receives in a short period of time in high-leveraged trades may contribute to the pathological processes. Gambling disorder has some common pathological aspects with substance use disorders such as tolerance and preoccupation (Sonkurt & Altınöz 2021). From a neurobiological point of view, considering the past substance use and the development of tolerance, the current case's involvement with cryptocurrencies suggests that cryptocurrencies may be used as a kind of substitution of substances.

CONCLUSION

Cryptocurrencies can become a risky venture especially for people with high risk-seeking, impulsive, history of alcohol-substance use disorder and inexperienced in financial markets. Margin trades with high leverage, especially without risk control such as stop loss, seem to reinforce the pathology. It may be possible to detect possible pathologies by questioning the involvement of people with similar clinical profiles to cryptocurrencies. In the treatment of cryptocurrency addiction, techniques such as cognitive restructuring, activity planning, behavioral activation that are applied in gambling disorder treatment, together with the treatment of comorbid psychiatric conditions, may be beneficial.

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