

Addiction in the Age of the Internet: The Case of E-drugs in the UAE

Ayman Alhawawsheh¹

Abstract

Preventing and protecting youth and society from drug harm is a goal that everyone seeks to achieve. In the first place, the legislative authority is entrusted with enacting laws and regulations to curb the new crimes, as the legislator succeeded in addressing in terms of criminalization and punishment for the crime of narcotic drugs and psychotropic substances. However, there is a legislative vacuum to stipulate a crime Digital drug, which the prosecution stands in front of confronting this crime in the absence of a text criminalizing this act based on the legal element of the crime (There is no crime and no punishment except by a text) which exacerbated the problem and made the matter more complicated. This study lies in shedding light on the possibility of providing digital drugs as reliable evidence to the investigation authorities, just like other types of drugs. The Results It's hard to criminalize digital drugs, because the Public Prosecution's reliance on the hormone dopamine in criminalization only, leads to the loss of the criminal case in proof by the Public Prosecution Office in the face of the accused, due to the difficulty of determining.

Keywords: Digital drugs, proof, sound, music, hallucinogen, illicit drug

Introduction

Binaural beats have grown in popularity recently, but biophysicists have been exploring the phenomenon since the 1970s. Binaural beats are created when two tones of slightly different frequencies are presented to each ear separately and simultaneously. For example, if we listen to a 440 Hz tone with your left ear and a 444 Hz tone with your right ear, we would perceive a modulating chord with an audible "beat" of 4 Hz (cycles per second). This beat is claimed to "entrain" brain waves and incite cognitive and mental effects; in some cases, mimicking the embodied experience of psychoactive drugs (BARRATT, 2022).

Digital drugs are one of the modern topics that have imposed themselves strongly on the Internet recently as a new phenomenon. It became the subject of great disagreement between experts and specialists and conflicting opinions about them, and there is no doubt that traditional drug use differs from digital drug use. It is natural that the effect of each will differ on the brain, and that this difference is due to many reasons, the most important of which is that digital drugs are free

¹ The author is an Associate Professor in Criminal Law , College of Law, American University in the Emirates. UAE., He can be reached at ayman.alhawawsheh@ae.ae

of any chemicals. and new crimes, including drugs, take the character of organized and transcontinental crimes. War is not only a military machine, which is what the criminals show, as countries can be killed through diversity in criminal methods such as digital drugs, as it addresses the ideas of young people, which criminals have resorted to using digital drugs as an alternative to traditional drugs, taking advantage of the legislative vacuum by not stipulating this crime.

Drug abuse is no longer limited to traditional methods that were previously, by intravenous injection, swallowing, smelling, or smoking, methods have developed. Recently other modern methods have appeared that youth use through digital abuse or electronic abuse, which is known as digital drugs. Digital drugs are one of the recent topics that have imposed themselves strongly on the Internet recently. It is a new phenomenon and has become a subject of great disagreement between experts, specialists, and scientists, and conflicting opinions about them. “Binaural beats are a sound illusion that occurs when you hear two different frequency tones — one in each ear, and the resulting sound you hear is claimed to alter the listener’s brain waves (Australia, 2022)“Most people said they used them ‘to relax or fall asleep’ and ‘to change my mood,” the same release notes, “while some said they used them to try ‘to get a similar effect to that of other drugs” (Australia, 2022).

To make this determination, the researchers evaluated responses from over 22,000 people across 22 countries as part of the 2021 Global Drug Survey, and their results were somewhat surprising.

Specifically, 72% of survey respondents who had used binaural beats claimed they did so to relax or fall asleep. 35% indicated they had tried binaural beats to change their current mood, and 12% said they were trying digital drugs to get a similar effect to that of an actual drug. Researchers note that some of the more popular binaural tracks found on streaming sites were named after drugs like cannabis or MDMA. (Australia, 2022)

“Much like ingestible substances, some binaural beats users were chasing a high,” said study lead author Dr. Monica Barratt of RMIT University. “But that’s far from their only use. Many people saw them as a source of help, such as for sleep therapy or pain relief.” (PLAIN, 2022)

No doubt using traditional drugs differs from using digital drugs, so, naturally, the effect of each of them differs on the brain. Drug use is no longer limited to the traditional methods that were in the past, by intravenous injection, swallowing, smelling, or Smoking, methods have developed, and other modern methods have recently appeared that youth have used, through digital abuse or electronic abuse, which is known as digital drugs.

While chemical drugs have well-documented effects on the body due to their direct chemical interactions, the impact of digital drugs is still a subject of debate. Some proponents argue that certain frequencies can influence brain activity, potentially inducing relaxation or focus. However, skepticism persists among experts who question the ability of digital drugs to produce significant mind-altering effects. Although it is difficult to prove, warning about digital drugs and their impact on human brains and no less dangerous chemical drugs. (Supplier, 2023).

Study Problem

The research problem arose out of the reality of the academic job experience of the current study. The importance of this study comes considering the absence of text regulating this issue in most of the legislation which enlightens the path before the Public Prosecution and the Court in determining the criminal responsibility for the abuse of digital drugs despite the spread of the so-called "Digital Drugs", effects have emerged psychological, biological, economic, and even security and cultural. However, all this is met with legal silence, so we needed to stand up to be our study as a glimmer of hope for future studies.

Literature Review

"Digital Drugs" are just binaural beats, which have been known about for over 150 years. The effect that binaural beats have is closer to hypnosis than getting high. Essentially two sine waves with close but slightly different frequencies are played into each ear through headphones (speakers won't work because the sounds will mix before reaching the ears). The brain processes the sounds as if they are the same frequency and must work to ignore the slight differences. When the difference between the frequency is adjusted to be close to actual brainwave frequencies, it allows for brainwaves to have a chance of being "amplified". This might have the effect of making you more alert, more relaxed, or other similar effects (Philipose, 2003).

A German named Heinrich Wilhelm Dove first discovered the concept behind digital drugs in 1839. Later, a scientist named Gerald Oster fleshed out the idea of binaural drugs in a 1973 issue of *Scientific American*, going into detail about how the brain processes two different sound frequencies at the same time.

Drugs are known as they are chemicals that cause drowsiness, sleep, and unconsciousness accompanied by pain relief, and the word narcotic translates to Narcotic, which is derived from the Greek (Narcosis), which means to numb or make a drug. (Nashash, 2012). drugs are also known as They are any substance

that affects the nervous system, to the extent that its function is weakened or lost temporarily (Hamid, 2012).

The medical definition of a drug is substances that, when taken in or administered into one's system, affect mental processes, e.g. perception, consciousness, cognition or mood, and emotions. Psychoactive drugs belong to a broader category of psychoactive substances that include also alcohol and nicotine. "Psychoactive" does not necessarily imply dependence-producing, and in common parlance, the term is often left unstated, as in "drug use", "substance use" or "substance abuse".) Organization(2024 'Production, distribution, sale, or non-medical use of many psychoactive drugs is either controlled or prohibited outside legally sanctioned channels by law. Psychoactive drugs have different degrees of restriction of availability, depending on their risks to health and therapeutic usefulness, and are classified according to a hierarchy of schedules at both national and international levels.

Mechanism of action of digital drugs

We all know that music can alter your mood. Sad songs can make you cry. Upbeat songs may give you an energy boost. But can music create the same effects as illegal drugs? This type of music targets the subconscious mind and requires a great deal of focus. The idea of digital drugs is based on striking the ears more precisely, which are sounds believed to be able to alter the patterns of brain waves and induce an alteration of the state of consciousness such as that which occurs through Taking medication or achieving a deep state of meditation; the beating of the ears occurs when two tones are played at slightly different frequencies together. Without headphones, the listener perceives the slight difference in two frequencies as a single, slightly waving tone. However, with headphones, the two notes are isolated, and the listener hears each frequency clearly in a different ear. As the brain processes the two tones, it must consider the slight difference between the frequencies. To the listener, this difference is seen as rhythmic beats inside the head. Normally, the human brain deals with rhythmic beats as electrical impulses or brain waves. The digital drug theory is to control these brain waves by synchronizing them with designated binaural beats, which is the same theory applied to the action of many medications known as biofeedback (Fawzi MM, 2017) .

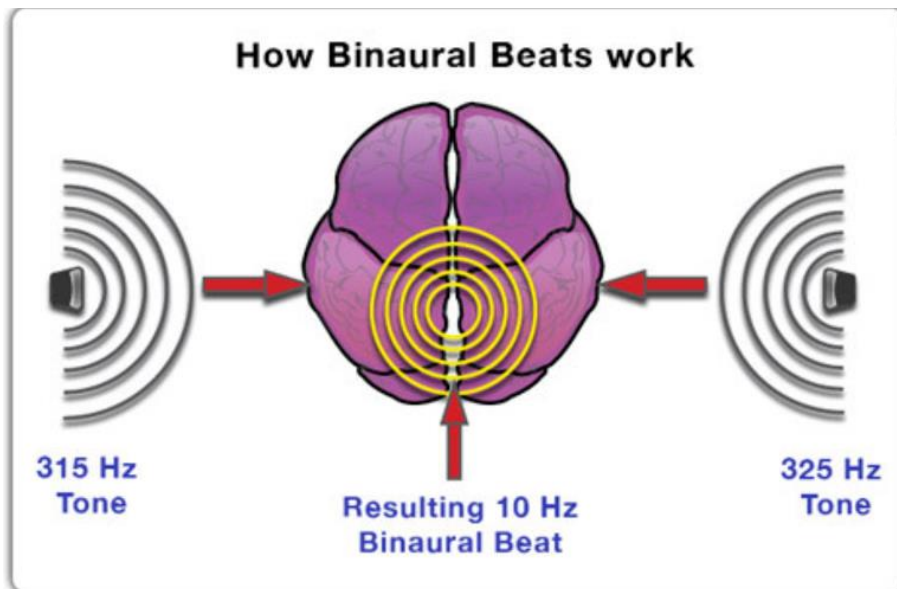
Frequencies are measured in units called hertz (Hz). By listening to two tones that differ within a certain hertz level, the listener hopes to achieve a certain mood or energy change. For example, if the listener wants to be very comfortable, they may choose to hear a tone of 140Hz in one ear and 145Hz in the other. The listener's brain perceives the difference between the two frequencies (5Hz) and

adjusts the listener's brain waves accordingly. If the listener wants to activate it, they may choose to listen at 130Hz in one ear and 150Hz in the other. A difference of 20 Hz in the frequencies may result in a different frame of mind with which dose packs can be downloaded from I-Doser (Fawzi MM, 2017)

The difference between frequencies and their consequences in digital drugs

The difference from 0.5-4 hertz causes the brain to enter a deep sleep state. The difference from 4-8 hertz causes the brain to go into sleepiness or sleep onset. the difference from 8 to 14 hertz causes the brain to enter a relaxed state, but still maintain a waking state. The difference from 14-30 hertz causes the brain to enter a state of intense wakefulness and high concentration (FILIMON, 2010).

To get the best alertness and activity, listening to a 130 Hz tone and a 150 Hz tone is preferable. For a completely relaxed state, it is preferable to listen to a tone of 140 Hz and a 145 Hz tone. And if you listen to these tones through external speakers, the difference between the two frequencies disappears and the brain receives them as one frequency. These tones should be heard only with headphones until they are distributed over the ears and the difference in frequency appears inside the brain. According to the Arab Information and Communication Organization, these digital drugs are intact vibrational waves between alpha, beta, and theta until access to information.



Then the brain processes the rhythmic stimulus as electrical impulses. The goal is to intentionally control electrical impulses and encourage the listener's brain to sync the brain waves with the beating of the ears. This synchronization, which is achieved by selecting binaural tones within a specific frequency level, is called the post-response frequency (FFF) and is part of a concept called entrainment. Entrainment, a biological rhythm synchronization with another, is not a new concept. It forms the basis for many types of meditation and biomedical nutrition. (BARRATT M. J., 2022).

All of these things do not mean that it is up to chance, whether you become addicted or not, but there are conditions for using the music clips to fulfill their purpose, including being isolated in a room, wearing headphones with the eyes covered, and completely relaxing so that the tones interact with the brain waves. And the application of that isolation in the room and the locking of doors and windows, closing the curtains, closing all devices, disconnecting their connection to the Internet, placing a blindfold on the eyes, lying on the bed, and placing the earphones to set off in the sea of this crime (Fawzi MM, 2017). Research investigating binaural beats has found that listening to these sounds may result in pain alleviation, anxiety reduction, and improved memory, but findings are mixed regarding its effects on concentration. However, there is very limited research exploring the extent to which people listen to binaural beats as a substitute for using psychoactive substances, or in conjunction with psychoactive substances to enhance their effects (BARRATT, 2022).

The question arises here Do Digital Drugs Make You High? (SPECIALIST, 2022). There is some evidence that exposure to binaural beats can shift the mind to an altered state. Hypnotherapists utilize this technology to induce a deeper level of consciousness in their clients. The clinical term used is brain entrainment. Manufacturers of brainwave entrainment devices claim that using them is the quickest way to achieve a Zen-like state of meditation. These audio tracks have also promoted relaxation, concentration, mental performance, and improved mood. To date, there hasn't been any scientific evidence that the tracks act as a drug analog as if the individual had ingested a recreational drug.

Medical and Psychological Perspectives on Digital Drugs

Digital drugs, or binaural beats that purport to elicit a drug-like state, are a phenomenon about which little is known. Digital drugs have many negative effects that threaten societies and pose a threat to their stability and survival due to the negative effects they carry on the health of the body and mind, waste of energies and wealth, and the inactivity and recklessness they cause, thus spoiling

the social relationship. So those dealing with this type of drug become a threat to the security of society. They are isolated from it, leave their work, and move away from their family and society in addition to the personal effects (Bittman B, 2003).

The use of digital drugs also produces health effects. The overdose of digital drugs can destroy the center of mental balance in young people, and affect the nerve and spinal cells in the listener's brain, and the psychological effects have a share of that, as it was found that it gives the listener a trance after hearing the music videos, then it makes young people prefer isolation and survival. In his room for long hours in front of the computer, young people feel hallucinations and hyperactive (Dair, 2024). Medical expertise is considered one of the important issues in the field of criminalization and punishment. Which is in harmony with the legislative authority when enacting laws, considering the interests of society and the purposes of Islamic law, especially in the United Arab Emirates. In addition to codifying criminal law, has only codified crimes of discretionary discretion. And before the judgment on the criminalization of digital drugs and the legislative authority's request to enact the necessary laws regarding this issue. We must return to the medical experts specializing in this matter who denied some of them the reality of addiction, and that they did not hear about it. He did not experience any addiction cases because of this type of drug, although he meets addicts every day due to his work. Their argument is further strengthened by the fact that there is not yet any scientific paper bearing conclusive evidence that this type of drug is addictive or harmful in any way (Hawat, 2014). This view is supported by another aspect as the effect of digital drugs is just a suggestion that depends on the person's acceptance of them and that their origin is psychological and not chemical.

The University of South Florida reveals, through a study it conducted, to find out whether the binaural beats phenomenon leads to an increase in focus in what is known as attention deficit hyperactivity disorder (ADHD), and it concluded that the phenomenon does not lead to chemical changes in the brain (Ghaferi, 2017).

However, the Oklahoma Bureau of Drugs and Dangerous Drugs believes that the biggest concern is when a child tries them and ends up smoking marijuana, for example. And last year a doctor faced the first two cases of addiction to digital drugs in the association. Where he was sheltered by the parents of two teenagers who suddenly isolated themselves in their rooms for long hours, heard strange music and their bodies began to shiver, and the parents were aware that their two children were not taking regular drugs (Commission, 1999).

Some believe that mere tampering with the perception of sound does not affect the perception of pleasure or anything else. He continues that these drugs

are neither good nor harmful, they are neutral. Another believes that these vibrations and sound waves lead to a bad effect on the abuser on the level of brain electricity, as it not only makes the recipient feel happy but also causes him what is known as mental distraction, which is one of the most dangerous moments that the brain reaches as it leads to separation from reality and severely reduced focus. Also, exposure to this change in the difference in the wave of electricity in the brain and its frequency, in addition to moments of fugue, leads to convulsion seizures in a person. And this is what we can confirm to you also by reading some old videos - we will not show them - that show young people taking them and how, after some time, they begin to hallucinate, tremble, convulsions, rapid breathing, and heartbeat.

In sum, it is to set a preventive and precautionary rule for digital drug use considering the facts that the experts have reached, according to the above, whether in the certain direction of its bad effects on the brain that mimics the effect of traditional drugs or in the other direction that strongly denies that. So we conclude the most likely opinion from experts and specialists on the effect of listening to audio files - at a minimum - on the auditory system that may lead to deafness, in addition to their agreement that using it leads to loss of money, and they concluded that using it leads to psychological addiction, because of its effects Destructive negativity, such as dysfunction and lack of concentration in brain cells (de Souza-Talarico JN, 2011).

The Legal Framework of Digital Drugs

The UAE legislator in Law No. 30 of 2021 in the fight against narcotic drugs and psychotropic substances has been known Narcotics: Every natural or synthetic substance listed in Table No. (1) and (2), (3), and (4) attached to this Law. As stated in the definition of Psychotropic substances: Every natural or synthetic substance listed in Tables Nos. (5) (6), (7), and (8) attached to this law. We conclude from these definitions that the legislator has restricted criminal drugs only to natural or synthetic substances from the substances listed in the attached table and therefore did not address digital drugs in the law (Al Ghaferi HA, 2017).

All laws at the international level and according to the United Nations bulletins did not mention a definition of this term. It only referred to the substances listed in the lists of dangerous drugs, by stating the names of the compounds and substances included in their composition, as well as mentioning the scientific names of these substances and their derivatives and emphasizing that they are considered narcotic substances And subject to legal penalties when misused. The reason for this is clear, as it is due to the legislator's attention to the issue of the possibility of creating new narcotic substances that are outside the

definition and with impunity until the law is amended and added to the definition, at least as is hoped for in digital drugs. As for the International Control Authority, it had a general definition of drugs from the legal point of view, which is (every raw or prepared substance that contains soothing, stimulant, or hallucinogenic elements or essences if used for other than medical purposes, it affects the central nervous system and leads to a complete or partial defect in its functions. It makes the user develop a state of illusion and imagination away from reality, and leads to his injury, either with addiction or habituation.).

The 1966 International Covenant on Economic, Social, and Cultural Rights also provides a text that affirms the right of everyone to enjoy the benefits of scientific progress and its applications and to protect the material and moral interests resulting from any scientific, artistic, or literary impact of his work (Aldrawsheh, 2022). This right shall be restricted to what is prescribed by law, provided that it aims to support public welfare in a democratic society, while the International Covenant on Civil and Political Rights 1966 contains a provision guaranteeing the right to freedom of expression this right includes freedom to access and impart information and ideas to others (Medan, 2018)1- Article 27 of the Universal Declaration of Human Rights, 1948. 2- Article 29 of the Universal Declaration of Human Rights, 1948.3- Article 15/1 of the International Covenant on Economic, Social and Cultural Rights, 1966.4- Article 4 of the International Covenant on Economic, Social and Cultural Rights, 1966. (NATIONS, 1988). We believe that the agreements do not contain text on digital drugs, which makes the matter more complicated for criminal law legislators.

Through these definitions, digital drugs differ significantly from traditional drugs in many respects, on the one hand, they are musical clips or audio files of different frequencies and are used by listening to these files. Traditional drugs are a chemical substance that causes their abusers to lose complete or partial consciousness temporarily, and they are used by smell, injection, or swallowing, the main difference between the two types is that digital drugs are free of any chemical substances, they are just music files, which is what encouraged young people to abuse it. On the other hand, traditional drugs have no disagreement about their negative impact on human health in all its different types and with different methods of abuse. As for digital drugs, they were the subject of great disagreement between scientists and experts about the extent of their effect on the brain (Qadir, 2012) .

The other legal problem that may face the investigation authorities and the judicial authorities is that the audio file cannot influence the abuser except with the presence of special headphones, which leads to the impossibility of accountability for those who promoted these files because it was not a crime

without the presence of the headphones, so the promoter escapes from Punishment. We do not hesitate to say that the Public Prosecution, in its capacity as the owner of the mandate to prove against the accused, will stand helpless without that, even if it seeks help from forensic experts, because it is difficult to prove it, as the place of proof and the article does not exist. In the UAE legislation and the Ministry of Health does not consider digital drugs real drugs. “The real danger of digital drugs is that young people would be tempted to try real drugs (Groenewegen H. J., 1991).

Dopamine for digital drug proof

A large armory of methods and techniques are today available to support scientific inquiry into medicines' biochemical efficacy and other consequences and side effects (Cornford, 2014). Dopamine (DA) transmission is deeply affected by drugs of abuse, and alterations in DA function are involved in the various phases of drug addiction and are potentially exploitable therapeutically. Basic studies have documented a reduction in the electrophysiological activity of DA neurons in alcohol, opiate, cannabinoid, and other drug-dependent rats. Further, DA release in the Nucleus accumbent (Nacc) is decreased in virtually all drug-dependent rodents. In parallel, these studies are supported by increments in intracranial self-stimulation (ICSS) thresholds during withdrawal from alcohol, nicotine, opiates, and other drugs of abuse, thereby suggesting a hypofunction of the neural substrate of ICSS. Accordingly, morphological evaluations fed into the realistic computational analysis of the medium spiny neuron of the Nacc, the post-synaptic counterpart of DA terminals, show profound changes in the structure and function of the entire mesolimbic system (Diana.M, 2011). Dopamine plays a major role in feelings of pleasure, happiness, and addiction. Dopamine is one of the chemical groups called neurotransmitters that carry information from one nerve cell to another (Tony Cornford, 2014).

Dopamine (DA) transmission is deeply affected by drugs of abuse, and alterations in DA function are involved in the various phases of drug addiction and are potentially exploitable therapeutically. Basic studies have documented a reduction in the electrophysiological activity of DA neurons in alcohol, opiate, cannabinoid, and other drug-dependent rats. Further, DA release in the Nucleus accumbent (Nacc) is decreased in virtually all drug-dependent rodents. In parallel, these studies are supported by increments in intracranial self-stimulation (ICSS) thresholds during withdrawal from alcohol, nicotine, opiates, and other drugs of abuse, thereby suggesting a hypofunction of the neural substrate of ICSS. Accordingly, morphological evaluations fed into the realistic computational analysis of the medium spiny neuron of the (Nacc), post-synaptic counterpart of

DA terminals, show profound changes in the structure and function of the entire mesolimbic system. In line with these findings, human imaging studies have shown a reduction of dopamine receptors accompanied by a lesser release of endogenous DA in the ventral striatum of cocaine, heroin, and alcohol-dependent subjects, thereby offering visual proof of the “dopamine-impooverished” addicted human brain. The lasting reduction in physiological activity of the DA system leads to the idea that an increment in its activity, to restore pre-drug levels, may yield significant clinical improvements (reduction of craving, relapse, and drug-seeking/taking). In theory, it may be achieved pharmacologically and/or with novel interventions such as transcranial magnetic stimulation (TMS (Diana.M, 2011). But we see from a legal perspective that it is difficult to determine the main cause of happiness and euphoria and to assign the matter to the hormone dopamine, which means that the accused is innocent of what is attributed to him (Rosenbaum, 2017).

Conclusions

The legal system in the United Arab Emirates lacks a legislative text on digital drugs. This paper has established the existence of the phenomenon of listening to binaural beats to elicit/changes in embodied and psychological state (i.e. ‘digital drugs’) and this study found It's hard to criminalize digital drugs, because the Public Prosecution’s reliance on the hormone dopamine in criminalization only, leads to the loss of the criminal case in proof by the Public Prosecution Office in the face of the accused, due to the difficulty of determining the main reason for the source of happiness and ecstasy for the accused based on the hormone dopamine.

Recommendations

- We must Develop plans and solutions for how to prevent digital drugs and define the responsibility of the individual, society, and governments towards the issue.
- As is the case for traditional drugs, governments must seek strong international cooperation and coordination to determine the source of these drugs and work to control their promoters through the exchange of information and experiences.
- It is increasing interest and awareness of training and education programs for safe and correct Internet use, through educational programs, media campaigns, and school curricula.
- UAE legislation and the UAE Ministry of Health do not consider digital drugs real drugs. “The real danger of digital drugs is that young people

would be tempted to try real drugs. Governments should carry out joint activities in society, especially with schools and universities, to conduct awareness sessions about the dangers of digital drugs, their impact, results, and ways to avoid them and not fall victim to them.

- There is a need for an awareness program directed to medical practitioners and the community in UAE, most appropriately through university toxicology and psychiatry sectors to provide a satisfactory level of knowledge of digital drug abuse.
- Effective awareness programs should be planned across the Arab countries targeting all community partners, including both healthcare and non-healthcare providers, aiming to combat the spread of digital drug abuse properly.
- It's important that we warn the public and start a campaign to make people aware of it. "It's already spread worldwide and can be downloaded in the UAE and listened to by college students. "Right now, it's not illegal but it should be, because it's a danger to society.

References

- A, S. .. (2015). *The role of the family in modern society: the role, challenges, support*, UAW - Abu Dhabi: Axis Two - Abu Dhabi.
- Al Ghaferi HA, A. A. (2017). Developing substance misuse services in the United Arab Emirates: the National Rehabilitation Centre experience. *BJPsych Int*, 14(4), 92-96.
- Aldrawsheh. (2022) . . The Phenomenon of Drug Abuse in the Jordanian Society and its Impact on the Individual and Society. *Dirasat: Human and Social Science*, 49(1), 241–268.
- Australia, U. (2022, 3 13). *Drugs go digital: People are using binaural beats to simulate or enhance drug effects*. Retrieved from <https://www.scimex.org/newsfeed/drugs-go-digital-people-are-using-binaural-beats-to-simulate-or-enhance-drug-effects>.
- BARRATT, M. J. (2022). Who uses digital drugs? An international survey of ‘binaural beat’ consumers. *Drug and Alcohol Review*, 41(5), 1126–1130.
- Beginner’s, A. (2022, 1 1). *Meditations/BinauralBeatsUserGuide.pdf*. Retrieved from <https://www.binauralbeatsmeditation.com/>.
- Bittman B, B. K. (2003). Recreational music-making: a cost-effective group interdisciplinary strategy for reducing burnout and improving mood states in long-term care workers. *National Library of Medicine*, 19(3-4):4-15.
- Commission, E. (1999, 1 1). . *Official Journal of the European Communities*. Retrieved from Regulation (EC) No 141/2000 of the European Parliament and the Council of 16 December on orphan medicinal products: <http://eur-lex.europa.eu>
- Cornford, T. L. (2014). Digital Drugs. *Information Systems and Global Assemblages. (Re)Configuring Actors, Artefacts, Organizations*. (pp. 149–162). Doolin, B., Lamprou, E., Mitev, N., McLeod, L. (eds): Springer, Berlin, Heidelberg.
- criminal, 609 (Court of Cassation in the Emirates 11 1, 2011).
- Dair, S. D. (2024). The Neural Impact of Binaural Beats. *Al-Bayan Center Studies Series*, 1-16.
- de Souza-Talarico JN, M. M. (2011). Effects of stress hormones on the brain and cognition: Evidence from normal to pathological aging. *Dement Neuropsychol*, 5(1), 8-16.
- Diana.M. (2011). The dopamine hypothesis of drug addiction and its potential therapeutic value. *Front Psychiatry*, 64(2), 1-7.
- Fawzi MM, M. F. (2017). Awareness of Digital Drugs Abuse and its Applied Prevention Among Healthcare Practitioners in KSA. *Arab Journal of Forensic Sciences & Forensic Medicine*, 1(6), 625-633.
- FILIMON, R. C. (2010). Beneficial Subliminal Music: Binaural Beats, Hemi-Sync, and Metamusic. *RECENT ADVANCES in ACOUSTICS & MUSIC*, 103-108.

- Ghaferi, H. A. (2017). Developing substance misuse services in the United Arab Emirates: the National Rehabilitation Centre experience. *BJPsych International*, 14(4): 92–96.
- Groenewegen H. J., B. H. (1991). in *The Mesolimbic Dopamine System: From Motivation to Action*, Scheel-Krüger J. (New York: Wiley: Willner P.
- Hamid, B. .. (2012). digital drugs. *their truth and effects* (p. P5). Jordan: Jerash University.
- Hawat, J. (2014). *Youth Against Drugs*. Lebanon, : <https://www.alarabiya.com>. (2014).
- Jirakittayakorn N, W. Y. (2015). The brain responds to different frequencies of binaural beat sounds on QEEG at the cortical level. *Annu Int Conf IEEE Eng Med Biol Soc*. (pp. 4687-91. doi: 10.1109/EMBC.2015.7319440. PMID: 26737340.). USA: National Library of Medicine.
- Medan, S. (2018). DIGITAL DRUG EXAMINES UNDER INTERNATIONAL LAW. *uran*, 855-860.
- Nashash, F. (2012). The Reality of Drug Use in Jordanian Society from a Gender Perspective, *The University of Jordan*, pg. 39.
- NATIONS, U. (1988). *UNITED NATIONS CONVENTION AGAINST ILLICIT TRAFFIC IN NARCOTIC DRUGS AND PSYCHOTROPIC SUBSTANCES*. New York City, U.S.: UNITED NATIONS.
- Organization, W. H. (2024, 1 1). *Drugs (psychoactive)*. Geneva: World Health Organization WHO. Retrieved from https://www.who.int/health-topics/drugs-psychoactive#tab=tab_1.
- Philipose, G. (2023). A brief study on Digital Drugs (Binaural beats). *International Journal of Creative Research*, 11(3), 299-305.
- PLAIN, C. (2022, April 5). *WHAT ARE 'DIGITAL DRUGS' AND WHO IS USING THEM?* Retrieved from <https://thedebrief.org/what-are-digital-drugs-and-who-is-using-them/>.
- Qadir, A. A. (2012). *Internet crime and ways to protect it*. KSA Riyadh: Al-Obeikan Library.
- Rosenbaum, S. (2017). *Digital Dopamine: When 'Delightful' Becomes a Drugby, Featured Contributor*, 23: October.
- SPECIALIST, T. T. (2022, 7 2). *What are Digital Drugs and Are They Dangerous?* Retrieved from <https://thetreatmentspecialist.com/digital-drugs>.
- Tony Cornford, a. V. (2014). Digital Drugs: an anatomy of new medicines. *IFIP Advances in Information and Communication Technology*, pp. 149-162.