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A Review of Psychological Intervention Strategies for Drug Addicts in Light of Modern Therapeutic Approaches and Artificial Intelligence

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Abstract

Drug addiction has long been recognized as one of the most critical psychological and social challenges facing global society, as it has spread across all nations without exception. Furthermore, this phenomenon is no longer restricted to a single demographic; it has become prevalent across various age groups and backgrounds, including children, youth, adults, the illiterate, and the highly educated. Beyond its detrimental effects on an individual's psychological, physical, and social equilibrium, the increasing complexity and prevalence of addiction have made psychological intervention the cornerstone of treatment, sustainable recovery, and relapse prevention, alongside medical and social interventions. This presentation aims to provide an analytical overview of the primary psychological intervention strategies for drug addiction. It reviews established therapeutic approaches, such as medical treatment, individual and group psychotherapy, and social therapy. Additionally, it highlights the integration of Artificial Intelligence (AI) in diagnosis and treatment. Recent studies have demonstrated the capacity of intelligent models to analyze addictive behavior patterns, predict relapse risks, and personalize digital therapeutic programs tailored to each individual's specific needs. These advancements enhance the prospects for sustainable recovery and the attainment of psychological well-being.

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Introduction :

It is evident that the prevalence of addiction is witnessing a global surge. International reports and statistics indicate that narcotics and psychotropic substances have swept through most countries via innovative scientific methods in manufacturing and smuggling. This has been further facilitated by advancements in global communication technologies. According to the 2009 United Nations report, the number of users reached 272 million worldwide, representing 3.3% of the total global population, or 6.1% of individuals aged 15–64. The report highlighted that the

second half of the twentieth century saw a significant expansion in the use of illicit drugs. Global figures also indicated that approximately 200,000 people died in 2000 due to drug use, accounting for 0.4% of total global deaths (World Drug Report, 2011, p. 13).

This alarming reality has prompted nations to strive against addiction through various means, including enacting specialized laws, establishing clinics and hospitals for treatment, and organizing awareness and prevention campaigns. Addiction costs humanity losses far exceeding those incurred during devastating wars, as it creates physical, psychological, social, and economic problems that require integrated local and international efforts (Al-Othaimin, 2008, p. 10).

Based on the above, this research paper aims to encompass various modern psychological treatments applied to this population, structured as follows:

An Overview of Therapeutic Methods for the Psychological Care of Drug Addicts

Addiction is considered one of the most challenging conditions to treat. The therapeutic process necessitates an integrated, multidisciplinary approach involving physicians, psychiatrists, nurses, psychologists, social workers, and other field practitioners. Among the primary types of treatment, we find:

1. Medical Treatment :

Medical treatment for drug addicts typically focuses on detoxification (Withdrawal Management). The individual is referred to a treatment center for a period of approximately 21 days to alleviate the severity of withdrawal symptoms—such as acute anxiety, insomnia, vomiting, diaphoresis (sweating), hallucinations, pain, and hypertension—by prescribing appropriate medications that help the patient endure and overcome this phase.

Upon admission, the patient undergoes medical screenings to detect infections such as HIV/AIDS, Hepatitis, Tuberculosis, or other infectious diseases. Subsequently, the center's staff provide medical supervision following stages that involve temporarily substituting drugs with substances that have less severe side effects, such as antidepressants, analgesics, anxiolytics, and anti-convulsants. Medical tests are conducted before and during treatment, whether inpatient or outpatient (in cases where the patient refuses residential treatment).

During recovery, physicians advise total abstinence from illicit drugs and caution against the misuse of addictive medications. A doctor may prescribe pain relievers or benzodiazepines for anxiety or insomnia in safe, monitored doses to ensure the patient does not develop a dependency or escalate the dosage without consultation. Following the medical treatment phase, the patient is advised to follow up with the medical team for several months to reinforce abstinence. In case of a relapse, the patient may benefit from re-entering the center or receiving outpatient care (Sayel, 2015, pp. 123-124).

Medical treatment for addiction can be summarized as follows:

- The Drug Substitution/Tapering Method: Gradually reducing the usual drug dosage, then substituting it with another medication whose dose is also tapered until total cessation is achieved (Gharmoush, n.d., p. 334).
- Hypnotic and Sedative Therapy: Prescribing specific sedatives, such as Largactil combined with hypnotics, for a period of five to eight days.
- Electroconvulsive Therapy (ECT): This technique has been used in some addiction cases to alleviate side effects of cessation, such as severe anxiety and depression (Okasha, 1976, p. 335).

Primary Objectives of Medical Treatment for Dependency:

- General sedation and stabilization of the patient.
- Eliminating secondary diseases resulting from addiction.

- Preventative treatment and management of potential complications.
- Gradually reducing physiological dependence on the substance until total detoxification is achieved, eliminating the chemical "craving."
- Restoring physical health and strengthening natural immunity (Sheehan, 2020, p. 96).

It is clear that the biological dimension of addiction plays a vital role, explaining the difficulty of cessation and the high risk of relapse. Therefore, medical intervention is a critical first step to restore biological equilibrium. This paves the way for psychological treatment, as the medical phase focuses on providing sedatives, antitoxins, and vitamins to manage withdrawal symptoms (detox) as a prerequisite for subsequent psychotherapy.

2. Psychotherapy :

Psychotherapy for drug addiction involves the application of psychological techniques and methods to assist individuals in overcoming dependency and achieving psychological well-being. This integrated framework aims to empower the individual to restore emotional and cognitive equilibrium, enhance positive coping mechanisms, and ultimately achieve psychological and social adjustment.

The Corsini Encyclopedia (2001) defines Psychotherapy as follows: According to Connolly and Chriss (2001), psychotherapy aims to effect a change in the patient's personality through specific techniques and tactics. These typically occur between a therapist and a patient (Individual Therapy) or a therapist and a group of patients (Group Psychotherapy). The goal is to lead group members to a state of insight and self-control over their internal processes, reaching a state of "normality" with themselves and others (Ghanem, 2003, pp. 14-19).

Treatment for drug or alcohol addiction generally aims at cessation of use, management of withdrawal symptoms, and relapse prevention. This therapeutic protocol is usually managed by a multidisciplinary team including a psychiatrist, psychologist, social worker, and a psychotherapist/psychoanalyst (Al-Zarrad, 2009, p. 43). In this regard, World Health Organization (WHO) experts have identified the stages of addiction treatment:

- Stage One (The Early Stage): This requires a sincere and genuine desire for recovery. The individual experiences an internal conflict between the intense craving for the drug and the resolve to quit. During this phase, cooperation with the psychological and medical teams begins to overcome initial hurdles.
- Stage Two (The Intermediate Stage): If successful in the first stage, the individual achieves detoxification. They may feel a temporary improvement lasting days or weeks, followed by emerging physical and psychological challenges. During this period, support and encouragement are vital to prevent a return to use, aided by peer support (former addicts), relatives, friends, and medical professionals treating comorbid symptoms.
- Stage Three (The Stabilization Stage): The recovering individual reaches a point where direct clinical treatment is no longer required. It is recommended that they participate in support groups to assist other addicts, encouraging them through difficult phases until full recovery is achieved. This perspective emphasizes that success depends not only on abstinence but on psychosocial support and reintegration into society (Sheehan, 2020, pp. 94-95).

3. Group Psychotherapy :

The term "Group Psychotherapy" was first introduced by Moreno (1932) to describe a therapeutic method combining "role-playing" techniques with spontaneous or direct therapy. He believed that social conditions could improve spontaneously as a result of group interactions (Fatim, 1993, p. 41).

The Encyclopedia of Psychology and Psychoanalysis defines it as: "A form of psychotherapy based on treating the patient within a group. The number of members varies according to the therapist's school of thought and the therapeutic goals, but it must consist of at least two individuals."

Schilder and Nachkashdan (1984) state that group therapy typically involves a gathering of six to eight individuals who usually meet once or twice a week for about 90 minutes. The group, often composed of strangers, meets regularly for six months to a year. Groups may be homogeneous (e.g., a group of addicts or individuals with depression) or heterogeneous, depending on the therapist's theoretical orientation. In this setting, the primary driver of change is the therapeutic group itself, while the psychologist's role is that of a facilitator (Retteb, 2018, pp. 136-137).

-Indications for Group Psychotherapy:

Group psychotherapy has been widely utilized in psychiatric hospitals, psychological clinics, child guidance clinics, and correctional institutions. Its benefits have been demonstrated in:

- Treating alcoholism, speech disorders, behavioral deviations, delinquency, neuroses, and psychoses.
- Treating patients characterized by social isolation, withdrawal, introversion, shyness, social maladjustment, depression, and feelings of inferiority resulting from physical, social, or psychological factors (Zahran, 1995, p. 310).

Moreover, therapy is effective in rehabilitating specific groups of patients with specialized issues, such as: (Psychiatric patients, drug addicts, alcoholics, obese patients, individuals with sexual dysfunctions, delinquent offenders, adolescents, the elderly, widows, and divorcees) (Al-Azza, 2000, p. 30).

4. Group Counseling :

Therapeutic group counseling aims to provide a safe, non-threatening, and tension-free environment where members interact to solve their problems; thus, it can be considered a problem-solving method. In this setting, individuals acquire various skills, such as active listening, turn-taking, discussion, interaction, brainstorming, exchanging ideas, and spontaneous, authentic self-expression (Retteb, 2018, p. 137).

Patricia and Steven (1996) emphasize the role of group counseling in addiction treatment programs, suggesting a frequency of two sessions per week. Each session begins with a 10–15 minute check-in and structuring phase, followed by 45–55 minutes for core therapeutic activities and exercises. The final 10 minutes are dedicated to closing and summarizing. Group counseling fosters a sense of social agency and effectiveness, while social skills, self-confidence, and rapport begin to flourish within the group atmosphere (Mushaqba, 2007, pp. 114-115).

5. Cognitive Behavioral Therapy (CBT) :

Founded by Donald Meichenbaum, this theory integrates behavioral concepts with cognitive principles. It is based on understanding the functions of internal dialogue, self-instruction, and self-observation to train individuals in problem-solving, self-control, and coping skills, thereby inducing change in both behavior and cognition (Shuqair, 2002, p. 213).

CBT is widely applied in modifying and treating hazardous substance use and addiction. Its roots lie in Social Cognitive Learning Theory, emphasizing the role of thoughts, beliefs, attitudes, and causal attributions that influence an individual's feelings and behaviors. In addiction treatment, these theoretical perspectives are often integrated into a single cohesive CBT model. Researchers have focused on developing treatment programs and assessment techniques that help addicts endure abstinence and adopt a healthy lifestyle characterized by stress management and social problem-solving (Sayel, 2015, p. 122). Relaxation techniques are among the most effective behavioral tools used to alleviate the tension resulting from cessation (Al-Hafni, 1995, p. 43).

6. Cognitive Behavioral Group Therapy (CBGT) :

The integration of behavioral and cognitive theories is relatively modern, stemming from the works of Aaron Beck (1976) and Albert Ellis (1962). This approach targets maladaptive thoughts and dysfunctional behavior patterns. CBGT is highly structured, utilizing homework, detailed record-keeping, and role-playing (behavioral rehearsal). Its distinct feature is the focus on Cognitive Restructuring.

Beck's Therapeutic Model: Beck asserts that psychological disorders often stem from systematic errors in thinking, misinterpretations of situations, jumping to conclusions, or an inability to plan effectively for external problems (Beck, 1993, p. 17). In 1992, Beck and his colleagues noted that drug users possess specific beliefs—activated by certain circumstances—that gradually intensify the craving, leading to distorted and complex belief systems (Sayel, 2001, p. 11). Beck and Emery (1977) applied this to addiction with the following goals:

- Structuring the patient's time and breaking the associations between the user and drug-related people, places, or things.
- Inhibiting drug-seeking behavior, correcting cognitive distortions, and de-linking craving from anxiety. The ultimate goal is total abstinence; as patients succeed, they develop new control beliefs (e.g., "I can live without drugs").

7. Rational Emotive Behavior Therapy (REBT) :

7.1 Cognitive Techniques: Disputing Irrational Beliefs is the cornerstone of this therapy. This includes disputing "must-ur bation" (absolutist demands), catastrophizing, "I-can't-stand-it-itis" (low frustration tolerance), and self-deprecation.

- 7.1.1 Auditory Therapy: Listening to lectures on REBT to help overcome anxiety, depression, and low frustration tolerance.
- 7.1.2 Pleasure/Pain Journals: Recording daily suffering versus the rewards of recovery.
- 7.1.3 Cognitive Distraction: Including progressive relaxation, meditation, and catharsis exercises to impede addictive impulses (Al-Hajjar, 2005, p. 35).

7.2 Emotive Techniques:

- 7.2.1 Shame-Attack Exercises: Addressing the shame and discomfort that often drive drug use through imagery-based confrontation.
- 7.2.2 Rational Emotive Imagery (REI): Developed by Maxie Maultsby, where the patient imagines a "catastrophic" event (like a relapse) and works on shifting their feelings from horror to healthy "disappointment" or "regret" (Al-Amiri, 2000, p. 33).
- 7.2.3 Positive Self-Talk: Training the client to repeat empowering statements to increase frustration tolerance.
- 7.2.4 Response Prevention: Intense monitoring (often in-hospital) to achieve self-regulation when other techniques fail.
- 7.2.5 Problem-Solving Training: Gagne (1966) described this as a learning activity where individuals choose the best behavioral response to events.
- 7.2.6 Distraction Methods: Using yoga, exercise, and breathing to redirect negative thoughts. However, Ellis notes these are often "feel-better" rather than "get-better" methods, providing short-term relief (Albert, n.d., p. 185).

8. Social Therapy :

A set of material and moral services provided through institutional relationships to help the client restore social functioning and achieve satisfactory social adjustment (Sheehan, 2020, p. 96).

8. Social and Family Therapy :

Social therapy focuses on repairing the damage caused by addiction and understanding the underlying circumstances. It strives to address these causes, ensuring a stable and secure environment within the family by organizing leisure time, providing recreational activities, and promoting social reintegration. The goal is to empower the individual to solve problems effectively and positively (Zay'our, 1986, p. 464).

Family-Oriented Therapy: This approach views an individual's suffering as a byproduct of dysfunctions within the family environment, resulting from communication disorders and poor internal dynamics. Key steps in family psychotherapy include helping the family accept the recovering member and identifying—and treating—familial risk factors (Nabulsi, 1988, p. 93).

Religious Counseling: This is rooted in the teachings of Islam, aiming for awareness and reform. It focuses on rectifying behaviors, correcting cognitive distortions, and highlighting the devastating physical and moral impacts of drug abuse.

9. Artificial Intelligence (AI) in Addiction Treatment :

9.1 Definition of Artificial Intelligence:

AI is an algorithmic process that simulates human intelligence through computer systems. It attempts to mimic human behavior and decision-making by utilizing advanced technological hardware and software.

9.2 Characteristics of AI:

- The ability to acquire and synthesize knowledge.
- The capacity to provide data-driven insights for administrative and clinical decisions.
- Learning and understanding from cumulative experience and historical data.
- Visualization, creativity, and conceptual understanding.
- The ability to manage ambiguous situations.
- Utilizing trial-and-error methodologies to explore diverse outcomes.
- Managing complex and high-stakes cases (Abdul-Muhsen, 2024, p. 368).

9.3 Neurobiological Mechanisms of Addiction and AI Interventions:

Chronic drug use leads to significant neurobiological changes. Potential mechanisms—including disruptions in synaptic plasticity, protein kinase signaling pathways, and phosphorylation—can be monitored and managed via AI. Intelligent systems aim to restore the balance between the limbic-cortical reward and aversion mechanisms without exacerbating psychotic states.

AI is particularly effective in assessing "addictive potential" by identifying critical features in pharmacokinetics and pharmacodynamics, as well as ADME processes (Absorption, Distribution, Metabolism, and Excretion) of various substances. Furthermore, AI assists in identifying risk factors within specific patient populations.

The Dorsal Striatum plays a decisive role in the development and maintenance of addiction, leading to compulsive drug-seeking behavior. In this state, this circuit becomes hyperactive while appearing disconnected from other parts of the striatal circuitry, such as the associative and motor striatum. Addiction involves various substances, each with distinct effects on the brain and body.

Table (01): Common Types of Psychoactive Substances

Inhalants	Hallucinogens	Sedatives	Opioids	Stimulants

Solvents, Aerosols, Gases, Nitrites (Glue, Paint, Gasoline, etc.)	Magic Mushrooms, Cannabis (Marijuana), Hashish	Benzodiazepines, Barbiturates	Heroin, Painkillers (Oxycodone, Hydrocodone, Morphine)	Cocaine, Methamphetamine, Amphetamines

Understanding these distinctions is crucial for developing effective therapeutic strategies tailored to the unique challenges posed by each substance (Shehata, 2025, pp. 11-12, adapted).

Given the critical importance of addressing various substance abuse problems, and amidst the rapid acceleration in adopting modern technologies—led by Artificial Intelligence (AI)—many researchers have called for the development of AI-based systems and tools to study these issues.

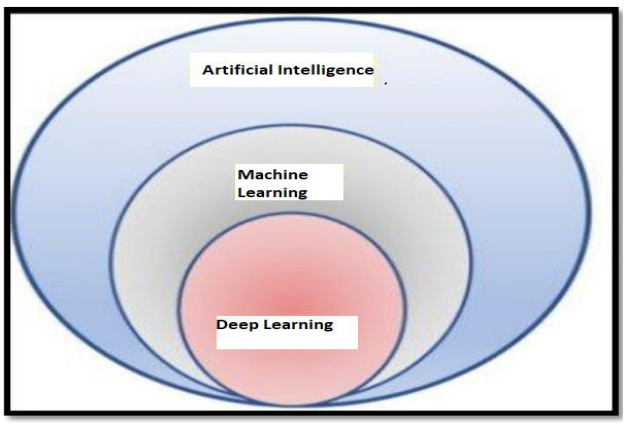
Emmanuel Kuntsche et al. (2025) reviewed studies utilizing Machine Learning (ML) in substance abuse research in a chapter titled "Artificial Intelligence in Substance Use Research." They provided a comprehensive description of AI, Machine Learning, and Deep Learning (DL). Based on their literature review, they demonstrated various ways ML can be applied to addiction research, specifically analyzing representations of alcohol in digital texts and images, with a focus on social media data.

Core Concepts in AI-Driven Addiction Research:

The research utilizes key terms such as Artificial Intelligence, Machine Learning, and Deep Learning. Machine Learning methods are generally classified into:

- Supervised Learning: In these tasks, the algorithm is provided with manually annotated data or labeled datasets. This approach is currently more prevalent in substance abuse research than unsupervised methods.
- Unsupervised Learning: This technique is used to cluster data based on similarities and identify patterns in unlabeled data. According to the study's data, it has been less common in substance abuse research to date.
- Deep Learning (DL): A specific subfield of Machine Learning that utilizes Artificial Neural Networks (ANN) designed to mimic the human brain. These networks consist of multiple layers that build increasingly abstract levels of features from the data (Shehata, 2025, p. 16, adapted).

Figure (01): Architecture of a Deep Neural Network (DNN)



(Shehata, 2025, p. 17)

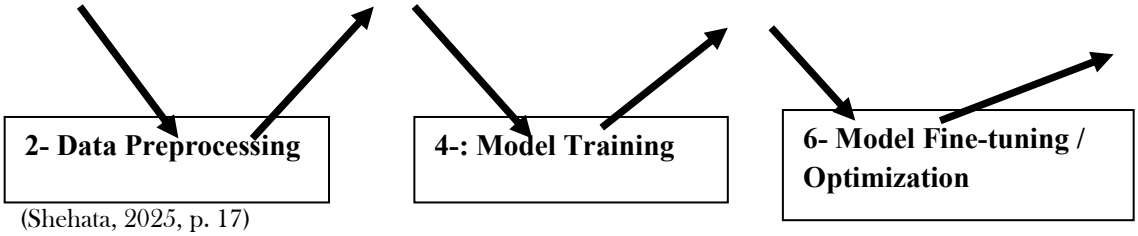
Figure (02): The Seven Steps of the Machine Learning Process

1- Data Collection

3- Model Selection

5- Model Evaluation / Measurement

7- Model Deployment for Predictive Analytics / Future Data Prediction



(Shehata, 2025, p. 17)

9.4. AI and Predicting Addiction to Respiratory/ Inhalant Substances :

Artificial Intelligence is a modern and effective tool for predicting addiction relapse, particularly in Cannabis Use Disorder (CUD). Relapse remains a major challenge in recovery, with studies indicating that over 50% of recovering individuals relapse within the first year of treatment. Relapse is linked to various psychological, social, and physiological factors, such as psychological stress, social isolation, anxiety and depression disorders, and prior usage history.

AI algorithms monitor these factors and predict relapse by analyzing real-time data collected via smartphone applications and wearable devices. This data includes indicators like mood swings, sleep disturbances, physical activity, social interaction, and heart rate—sensitive markers that reveal early signs of potential relapse (Shehata, 2025, p. 20).

9.5 Key Behavioral Signals

- Mood Changes: Anxiety, irritability, or depression increase the risk of relapse.
- Social Engagement: Withdrawal from support networks indicates vulnerability.
- Physical Activity: Sudden decline in activity or sleep disturbance indicates distress.
- Craving: One of the most critical behavioral indicators; it is a powerful psychological response driving the individual to seek the substance. It can be observed through self-reported behavior or actions indicating a search for cues associated with cannabis or other substances (Farhan & Al-Janabi, 2025, p. 234).

AI technologies analyze these phenomena through Machine Learning (ML) and Natural Language Processing (NLP). They interpret behavioral and linguistic data to detect negative emotional states or risky behavioral trends associated with cravings, facilitating early prediction and timely therapeutic intervention.

9.6 How Does AI Detect These Signals?

AI analyzes behavioral and physiological data from mobile apps, wearables, and social media to identify relapse patterns:

- Social Isolation: Machine Learning detects decreased communication activity and changes in geolocation, signaling withdrawal from social networks—a primary risk factor for relapse.
- Sleep Patterns: Deep learning models, such as Recurrent Neural Networks (RNNs) and Long Short-Term Memory (LSTM), analyze wearable data for sleep disturbances or irregularities linked to stress and cravings. Integrated signals like heart rate and sleep stages enhance accuracy.
- Mood Tracking: NLP tools analyze social media and digital journals to detect negative emotions or keywords related to relapse (e.g., "craving," "stress"), highlighting emotional distress.
- Physiological Patterns: AI examines Heart Rate Variability (HRV), skin conductance, and activity levels to identify stress-related arousal, signaling an increased risk of relapse.

9.7 AI Applications in Intelligent Treatment Programs

AI applications in "Smart Treatment" programs are undergoing a radical shift in service delivery, becoming a pivotal element in supporting mental and behavioral health. Intelligent Robots (Social Robots) are among the most prominent technologies, positively impacting patient interaction, especially in cases requiring continuous emotional and behavioral support. Recent studies highlight the role of robots in Behavioral Therapy by providing support based on pattern analysis and offering directed advice to help addicts avoid triggers. Robots also monitor patients using sensors and ML, alerting clinical teams to psychological changes. Some use NLP to interact with patients in ways that foster a sense of safety and comfort, reducing loneliness (Farhan & Al-Janabi, 2025, p. 234, adapted).

9.8 Designing Personalized Addiction Treatment Programs :

Designing data-driven Personalized Rehabilitation Programs is a major advancement. Rapid progress in data analytics allows healthcare institutions to develop precise strategies tailored to individual needs. This shift involves deep analysis of clinical, social, and psychological data to create highly accurate treatment plans.

The design process utilizes advanced analytical tools for clinical and psychological data from sources like Electronic Health Records (EHR), patient questionnaires, and smart tracking apps. ML and AI identify specific behavioral patterns and individual needs. By analyzing variables like age, general health status, and pre-injury physical activity levels, clinicians can develop tailored rehabilitation plans including appropriate physical exercises, psychotherapy sessions, and nutritional support.

Furthermore, personalization techniques improve treatment efficacy by interacting directly with patient data for proactively adjusted plans. Remote monitoring applications encourage continuous patient participation, reducing medical errors through real-time Clinical Decision Support Systems (CDSS). This approach minimizes human error in assessment and enhances the precision of therapeutic interventions (Farhani & Al-Janabi, 2025, pp. 231-232, adapted).

7. Review of Previous Studies :

- Study by Sherine Morcos Masri Qadis (2025):
  - *Title:* "The Effectiveness of a Proposed Program Based on Generative AI Tools in Achieving Education Standards to Confront Drug Abuse among Science Teacher Students."
  - *Objective:* To evaluate a program using Generative AI tools to meet educational standards against drug abuse. The sample included science students (Biology, Geology, Chemistry, Physics) at the Faculty of Education in Qena.
  - *Methodology:* Experimental method using tests and scales for cognitive, affective, and performance standards.
  - *Results:* Confirmed the effectiveness of the proposed program across all educational domains.
- Study by Hind Khalid Humaid (2025):
  - *Title:* "The Role of Computer Technology in Combating Drug Abuse."
  - *Sample:* 300 former users, public health experts, and IT specialists.
  - *Methodology:* Descriptive method using an electronic survey for data collection.
  - *Results:* Digital interventions significantly enhance traditional preventive strategies in the fight against drug abuse.

Conclusion :

In conclusion, it is evident that drug addiction is a complex and multifaceted issue that exhausts the potential of the youth, who represent the backbone of human capital. Modern addiction treatment has evolved to be grounded in a comprehensive understanding of the addict's nature, belief system, emotions, and affective states. This necessitates rapid and effective therapeutic intervention through integrated modern approaches.

These approaches encompass medical, psychological, and social treatments, as well as technological therapy, which has emerged as one of the latest innovations in psychological practice. By employing digital techniques and intelligent interfaces in diagnosis, treatment, and follow-up—and even predicting patient outcomes post-treatment—a new

horizon is revealed. This integration between advanced technology and humanistic psychotherapy paves the way for holistic psychological care, ultimately aiming to achieve mental health and sustainable recovery.

Ethical Considerations

This review study is based exclusively on the analysis and synthesis of previously published academic literature and publicly available sources. It did not involve direct interaction with human participants, clinical experimentation, or the collection of personal or sensitive data. Consequently, formal ethical approval from an institutional review board was not required. Nevertheless, the authors adhered to established ethical principles of scholarly research, including academic integrity, accurate citation of sources, and responsible interpretation of findings. Particular care was taken to present addiction-related issues with sensitivity and respect, avoiding stigmatization of individuals affected by substance use disorders.

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Author Contributions

- **Dr. Ouassila Retteb**: Conceptualization of the study; literature review; theoretical framework development; drafting of the manuscript; integration of artificial intelligence perspectives in addiction treatment.
- **Dr. Bekkar Boubakeur**: Methodological guidance; critical revision of the manuscript; validation of psychological and therapeutic content; contribution to the discussion and final approval of the submitted version.

All authors have read and approved the final manuscript and agree to be accountable for all aspects of the work.

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Conflict of Interest

The authors declare **no conflict of interest** regarding the publication of this article. The research was conducted in the absence of any financial or personal relationships that could be construed as a potential conflict.

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