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Utilization of Artificial Intelligence in Prevention of Drug Abuse Among Youths in Ekwusigo LGA of Anambra State

Nnaemeka, Obidike Frank[1] & Igwe, Jemilian Uchechukwu [2]

[1,2] Department of Mass Communication, Chukwuemeka Odumegwu Ojukwu University, Igbariam Campus, Anambra State. E-mail: fo.nnaemeka@coou.edu.ng, jemillianigwe@yahoo.com

Abstract

The advancement of Artificial Intelligence (AI) technology has been rapid and this has the potential to greatly improve as well as transform a whole lot of human endeavour, including the field of drug abuse prevention. AI can assist in early detection and intervention for individuals at risk. It does these tasks by analyzing data and identifying patterns in behavior and risk factors. It is also important to note that AI has the ability to identify and target specific population, who are in need of prevention efforts. This study reviewed current scholarly works in the use of AI in different fields. It explored the potential benefits and challenges of implementing AI in the prevention of drug abuse among the youths particularly in Ekwusigo LGA in Anambra State. The main objective of the study was to determine whether AI has the capacity to prevent drug abuse among youths in Ekwusigo LGA in Anambra State. The study, through the quantitative research design, adopted the survey research method in carrying out the study. The finding among others showed that AI possesses the capacity and can generate the data to aid in the prevention of drug abuse among the youths. It recommends among others that efforts at drug prevention should be laden with AI advances for effectiveness.

Keywords: Artificial Intelligence, Detection and Intervention, Drug Abuse, Youths

Introduction

That Artificial Intelligence (AI) technology is increasingly present in our daily lives is no more in doubts (Ifejesu, 2021). Today, artificial intelligence stands at the forefront of modern technological advancements, offering transformative solutions across various industries. From autonomous vehicles to intelligent virtual assistants, AI's potential to reshape society is undeniable. Yet, one area

where its impact remains largely untapped is in the fight against alcohol and drug abuse. To be disconnected from information is to cease to exist (Enemuo, Ezeanyi & Ezeaka 2019).
While AI has the capacity to revolutionize addiction treatment and prevention, its application in this critical realm remains underutilized (Chopra, Baig & Guatam, 2022).

One of the most promising aspects of AI in combating substance abuse lies in its ability to provide affordable and accessible treatment options for individuals grappling with substance use disorder (SUD). The exorbitant costs associated with traditional rehabilitation centers often present a significant barrier to those seeking help. However, through AI-powered telehealth platforms, chatbots, and virtual counseling services, individuals, particularly those from marginalized communities, can access timely assistance and support. These innovations can offer personalized treatment plans, daily motivation, and progress tracking, thereby enhancing treatment outcomes and accessibility (King, 2023).

Still in treatment, AI can analyze an individual's history, genetics, and the severity of their addiction to develop a personalized treatment plan tailored to their needs. Each person's path to recovery is unique, with some requiring longer therapy periods or experiencing relapses. However, AI's personalized treatment plans can significantly increase the likelihood of success by addressing specific factors contributing to the individual's addiction and recovery journey (Paul, Sanap & Shenoy, 2021).

Moreover, AI holds tremendous potential in predicting and preventing relapse among individuals in recovery. By analyzing vast amounts of data, including online behaviour patterns and information keyed in to assess their current situations, AI algorithms can identify individuals at risk of relapse or substance use. Early intervention strategies can then be implemented to provide timely support and minimize the likelihood of relapse, ultimately improving long-term recovery outcomes (Marchant, 2020) .

Peer support is a crucial component of the recovery journey, offering individuals a sense of community, understanding, and encouragement. AI-powered platforms can facilitate connections between individuals with shared experiences, fostering a supportive environment conducive to recovery. These digital communities provide valuable emotional support, guidance, and accountability, strengthening individuals' resolve to overcome addiction (Arabi, 2021). Furthermore,

AI can play a crucial role in substance use and public health surveillance. AI algorithms can monitor and analyze data from social media and other digital sources to detect trends in drug use, emerging substances, and places of distribution, facilitating prompt responses. Additionally, AI can dissect public perceptions of substance use, allowing for targeted efforts to change negative perceptions or reinforce positive ones. This capability enables authorities to make informed decisions based on public feedback, enhancing strategies in the ongoing fight against alcohol and drug abuse (Lee, Kim & Joe, 2019).

The integration of AI into the fight against drug abuse holds immense promise for transforming addiction treatment, prevention, and control. By leveraging AI's capabilities, we can enhance accessibility, effectiveness, and efficiency in combating substance abuse, ultimately leading to healthier and safer communities. Embracing AI as a valuable ally in this critical endeavor will empower individuals, healthcare professionals, and policymakers to address the complexities of addiction with precision and efficacy, driving meaningful change in the fight against substance abuse (Smith & Anderson, 2018).

Statement of the Problem

The fight against drug abuse in our society has been a recurrent one. Through diverse means and media, the fight has taken various dimensions but today, the birth of an emerging technology called Artificial intelligence (AI) has recorded a great deal of success in procuring not only data but also the technological knowhow to fight drug abuse. This technology has been adopted in various communities of the Western world to combat the spread of drug abuse. By leveraging AI capabilities, according to King (2023), it is possible to facilitate accessibility, effectiveness, and efficiency in combating drug abuse, which portends healthier and safer communities. The problem is whether AI has the potentialities to prevent drug abuse among youths in Ekwusigo LGA of Anambra State, Nigeria is not known. This has constituted a gap- in –knowledge which this study seeks to fill. Can it therefore be said that AI has the potentialities to prevent indiscriminate consumption of hard drugs among youths in Ekwusigo LGA of Anambra State, Nigeria?

Objectives of the Study

The main objective of the study is to examine whether the potentialities of the emerging AI technology can be utilized in preventing drug abuse among youths in Ozubulu Community of Anambra State, Nigeria. The specific objectives are to:

1. Assess respondents' knowledge of Artificial Intelligence
2. Know whether respondents use AI to receive information on drug abuse
3. Ascertain whether AI has the potentialities to prevent drug abuse

Theory of Drug Abuse

Theories of drug abuse indicate that some people truly depend on certain drugs for their survival due to a number of factors. The major emphasis of the theories is that people have their individual reasons for depending on one type of the drug or the other. Such reasons are inability to delay gratification, low tolerance for frustration, poor impulse control, and high emotional dependence on other people, poor coping ability and low self-esteem. Individuals with these personality characteristics find it difficult to abstain from drug abuse. Drug abuse is a prevailing global public health concern which has been identified to have diverse and devastating effects in the society (Ezeaka, Nwodu & Agbanu 2022).

(b) Learning Theory of Drug Abuse: It maintains that dependence or abuse of drugs occurs as a result of learning. The learning could be by means of conditioning, instrumental learning or social learning.

(c) Biological Theory of Drug Abuse: The theory maintains that drug abuse is determined by the individual's biological or genetic factors which make them vulnerable to drug addiction

(d) Socio-cultural Theories of Drug Dependence/Abuse: The theories maintain that abuse is determined by socio-cultural values of the people. For instance, while certain cultures permit the consumption of alcohol and marijuana, other cultures do not. Among the Urhobo, Ijaw, Ibibio, Edo, Igbo, Yoruba and Itsekiri, alcohol i.e. Ogogoro is used in cultural activities. In Northern Nigeria, alcohol is forbidden due to Sharia law. However, the sharing law does not forbid cigarette consumption and thus nicotine dependence. It should be noted, however that no theory fully explains the etiology of drug abuse. This is due to individual differences. It then becomes obvious that the

disorder (drug abuse) is an acquired one. The acquisition then is dependent on a host of personal inclinations and environmental factors, a situation explained social cognitive theory, i.e. the triadic reciprocity involving behaviour, environment and the person.

Review of Literature

Conceptual Overview of Artificial Intelligence and its Trajectory

AI first began to flourish in the 1950s, with Alan Turing, a theoretical biologist and computer scientist, serving as a key architect through his imitation game tests that sought to explore if a computing machine, once trained (i.e., through equation-based coding), could convincingly manifest human intelligence or behavior.(Rajpurkar, Chen, Banerjee, Topol, 2022). With a similar focus on cognitive verisimilitude, modern AI based algorithms are guided by formal and informal logic that seeks to iterate into end-users' desired epistemic touch points. Through this progression-based flow, AI systems can learn and adjust to reify specific tendencies of the end-user, engendering increasing sophistication and salience in terms of its responses. AI first formally appeared in medical settings with MYCIN, a computer-based consultation system developed in the 1970s at Stanford University, which was used to aid clinicians in diagnosis/therapy selection for patients with bacterial infections (Lin, Lin & Lane, 2020). Over time, AI advancements in medicine have moved beyond merely improving diagnostic accuracy and efficiency to spearheading drug curation and development, medical imaging, management of medical data, and even performing surgical procedures (Marchant, 2020).

Because AI has become more mainstream, this crystallized by the recent explosion of popularity of intricate personalized chatbots like ChatGPT, the threshold for executing sophisticated AI processes has lowered, increasing usability and thus scalability and potential for widespread abuse. This dichotomy carries particularly pronounced implications for excursions into medicine. In particular, drug addiction medicine, a field with persistent fissures in epidemiologic surveillance and treatment adherence, holds considerable promise–and risk– as a testing ground for the new wave of AI developments. In the present context, there is thus a need for discourse on the quality of sourced information, ethics and data privacy, and the larger sociocultural impacts that AI can have on drug addiction medicine (*The Guardian*, 3rd June 2023).

Current AI approaches in drug addiction medicine have primarily focused on augmenting epidemiologic understandings of drug use initiation pathways, an upstream prevention approach, and overdose/hazardous use likelihood, a downstream prevention approach. To this end, several AI tools have utilized machine learning, driven by supervised, unsupervised, and semi-supervised mechanisms, to help predict and identify risks among PWUD (Forbes, 13th 2021).

Despite being a developing logic, the origin and record of machine learning have been the concern of intricate scholarly associations over the past few decades. The discipline originated from other technical fields, like computer science and statistics. Although tools, systems, and trade skills indicate a background, the evolving links between diverse subfields are not yet entirely comprehensible. This historical organization is the product of numerous interlocking institutional communities and alternatives: industry and academia, National and foreign, public science funders and private profit-focused firms, the world of finance, clinical research, large and small laboratories, and theoretical libraries and practical (The Guardian, 3rd June, 2023).

However, the advancement of ML and the building of this organization – by engineers and researchers from a variety of frames of reference and languages – has enabled dramatically more precise responses to complex continuous technological and commercial issues, just as the growing availability of statistical learning libraries made it simpler for anyone to implement them. With the blend of logic and engineering that traditional artificial intelligence cannot conquer, machine learning (ML) has exceeded human-level understanding capabilities (Lee, Kim, Joe, 2019).

The future of scientific inquiry is fraught with obstacles and secrets; understanding is hampered by human cognitive reliability and computational ability, as well as goal-oriented reasoning under conflict (Liang, Tadesse & Ho., 2024). These complexities go beyond the ability of traditional artificial intelligence (AI) systems, which are confined in their scope and competence. Machine learning is an incorporated theory developed from connectionism, statistical modeling, data analysis, and hypothesis analysis ((Forbes, 13th April, 2021). This means it substantially improves cognitive capacity, especially in studying human beings in the last decade. The vast number of tools and systems underlying machine learning theory is a testament to the critical impact of rethinking the nature of knowledge and acquiring new knowledge in domains such as image recognition and natural language understanding (Li, 2018).

Artificial Intelligence and its Application

The universal adoption of AI and its applications in diverse fields of endeavour has raised important issues, which among others are ethical, social, and legal aspects, effects of AI use and adoption on human behavior and strategic interests of nations, security and privacy concerns. There is also the long-term implications of AI-based autonomous physical systems and knowledge of human welfare (Liang, Tadesse, & Ho, 2024). AI contributes directly and indirectly to the global economy in several ways, including through the labor market, businesses, economic sectors, and broader processes such as innovation (Kesden & Steinle, 2021). It has led to higher economic growth, improved standard of life, and new competitive advantages. The global race to dominate AI research and related technological applications is currently at an all-time high, with the US, Europe, and China leading.

A wide range of applications integrating the latest AI techniques, such as machine learning, deep learning, natural language processing, and computer vision, are emerging in recent times that have enormous economic and societal impacts in different domains, including technology, healthcare, finance, education, web search, robotics, marketing, IoT (Internet of Things), supply chain management, agriculture, and entertainment, etc. These AI applications are powered or supported by complex predictive or decision systems, often modeled as statistical estimators or classifiers, operating in real-time (Paul, Sanap, &Shenoy, 2022). In addition, AI is catering to unique demands for application domains dealing with complex, time-varying phenomena that require handling large-scale and high-dimensional data, such as in financial markets and IoT networks.

Utilizing AI Technology in the fight against Drug Abuse

Artificial Intelligence (AI) represents a potentially hard or unlikely task of immense impact in the drug use field in terms of primary prevention. This also means preventing drug use initiation and in reducing morbidities among people who use drugs (PWUDs) or secondary prevention. However, through various forms of programmatic manipulation and misinformation and disinformation, AI could undercut clinical standards in the field (Gupta, Srivastava, Sahu, 2021). The knowledge of current AI applications and potential hazards can provide recommendations for safely and meaningfully integrating AI into the drug use prevention and management space. AI's basic mechanics and logic has potentially makes it attractive area of research that holds great promise. Drug abuse can lead to anxiety, confusion, insomnia, mood swings and violent behavior from user (Nwammuo, Ezeaka, Anunobi, Ozumba & Aghaebe, 2023).

The concerns about the ethical implications of AI–such as algorithmic bias, racism, or disinformation–have also escalated because it is recognized that these problems can generate adverse results. While these issues are not unique to AI, they are particularly pronounced in this field, highlighting AI's unique properties and importance (Melo, Maasch, de la Fuente-Nunez, 2021). AI interests people because it can modify behaviors, allowing malware to track a particular person's location. If people use a new statistical application to filter the material they see, how can they do so that they know they are not being fooled? Excellent know-how of AI properties and their consequences will likely also be necessary for federal policies on AI safety and accountability (The Guardian, 3rd June, 2023). AI is a substantial part of the technological landscape used in various industries, including finance, healthcare, transportation, etc. Even though well-established definitions and general AI types are available, AI is a complex and ever-evolving notion (Zhu, Wang, Wang, 2021).

According to the European Union Coordinated Plan (February, 2020), AI's essence lies in assessing, reasoning, and acting autonomously. Kesden & Steinle (2021) defined AI as technologies that accomplish human tasks and solve human problems in a way that once required humans to do it. The main idea about the relationship between AI and humans is that no explicit programming is performed, and solutions are not predefined yet discovered with specialized algorithms. The notion of AI has evolved over the years, and many AI subfields have been brought to the literature, leading to supervised, unsupervised, reinforcement learning, and DL progress. The development of AI has also been influenced by cross-discipline studies such as psychology and linguistics. AI, whose ideas arose at the intersection of these complementary disciplines, such as decision tree classification in its early years. Artificial Intelligence (AI) is a growing field that has the potential to revolutionize our daily lives. The term AI dates back to 1956, first coined at a Dartmouth College workshop ((Paul, Sanap, Shenoy, 2024)..

However, AI has been a hot topic in technology and engineering over the last few years, sparking numerous discussions and debates about its benefits, pitfalls, and future. The major problem with AI is that most genuinely "intelligent" systems today use statistical methods, which is why AI has been named "statistical inference." Even the most sophisticated deep learning techniques, such as the 175-billion parameter GPT-3, do not truly understand what they are saying, as Daniel Pettitt so elegantly demonstrates in his article "The AI Delusion" (Chopra, Baig, Guatam, 2022).

Methodology

The researchers adopted the quantitative research design while utilizing the survey method in carrying out the study. The population of the study is 86, 874 registered voters in Ekwusigo Local Government Area (INEC, 2023). The sample size for the study is determined using the convenience sampling technique. Relying on Wimmer and Dominick (2011) recommendation which says that a sample size of 50 is very poor, 100 is poor, 200 is fair, 300 is good, 400 is very good. The researchers decided to use 350, which lies between good and very good as the sample size for the study. The questionnaire was used as the instrument for data collection. Both the purposive and accidental research design were adopted in selecting the actual respondents. Data gathered from the respondents were analysed using frequency table and percentages.

1. **Research Question 1:** *What is respondents' level of knowledge of Artificial Intelligence?*

Table 1: Respondents' level of knowledge of AI

Response categories	Frequency	Percentage
Very high	55	20.2
High	92	33.8
Fairly high	47	17.3
Not high	78	28.7
Total	272	100

Source: Researchers' Field Survey, 2024

Table 1 above shows that the 20.2% of the respondents in study answered very high, when their level of knowledge of AI, another 33.8% indicated high, 17.3% said fairly high while 28.7% answered not high. This is an indication that more than 2/3 majority of the respondents have high level knowledge of AI.

2. **Research Question 2:** *Do respondents use AI to receive information on drug abuse?*

Table 2: Respondents' Use of AI in Receiving Information on Drug Abuse

Response categories	Frequency	Percentage
Yes	232	66.3
No	42	12.0
Don't know	76	21.7
Total	350	100

Source: Researchers' Field Survey, 2024

Data in Table 2 show that 66. 3% of the respondents answered 'Yes' in response to whether they receive information on drug abuse through AI, 12% answered 'No' while 21.7% do not have an answer to the question. This is an indication that a more than two thirds majority of the respondents receive information on drug abuse through AI.

3. **Research Question 3:** *Does AI have the potentialities to prevent drug abuse?*

Table 3: Response on The Potential of AI In Preventing Drug Abuse

Response categories	Frequency	Percentage
Yes	228	65.1
No	36	10.3
Don't know	86	24.6
Total	350	100

Source: Researchers' Field Survey, 2024

Data in Table 3 show that 65.1% of the respondents indicated 'Yes' when asked whether AI has the potential to prevent drug abuse, 10.3% answered 'No' while 24.6% do not have answer to the question. This means that more than two thirds majority of the respondents agreed that AI has the potential to prevent drug abuse among the youths.

Discussion of Findings

From the data presented and analysed, it is safe to say that AI has come to stay as a veritable tool that can enhance almost every aspect of human endeavours, including prevention of drug abuse. The analysis is evident that AI is becoming very popular and many people are beginning to use it for one reason or purpose or the other. This wide knowledge of AI as seen in research question one lends support to an earlier submission by IfeJesu (2021), who submitted that artificial intelligence technology is increasingly present in our daily lives is no more in doubts.

Also, from research question two, it was discovered that a more than two thirds majority of the respondents receive information on drug abuse through AI. Give that a wide range of applications integrating the latest AI techniques, such as machine learning, deep learning, natural language processing, and computer vision, are emerging in recent times that have enormous economic and societal impacts in different domains, including information generation and dissemination according to Paul, Sanap, & Shenoy (2022), gives credence to the finding.

Finally, analysis of data in research question three show that a more than two thirds majority of the respondents agreed that AI has the potential to prevent drug abuse among the youths. This finding lends support to an earlier submission by King (2023), who stated that AI capabilities is possible to facilitate accessibility, effectiveness, and efficiency in combating drug abuse, which portends healthier and safer communities. Also, according to Chopra, Baig & Guatam (2022), AI has the capacity to revolutionize addiction treatment and prevention and its application in this critical realm remains underutilized.

Conclusion

From the analysis of various data in the study, it becomes a common knowledge that AI is achieving communication purpose. This understanding portends very positive expectations that the phenomenon can equally revolutionize the way drug sensitization messages targeting the youths are crafted. The findings from the study are an indication that AI has not only the potential to generate and disseminate Critical information on drug prevention, it also has the ability to

recommend the best treatment for Addiction. The simultaneous adoption of rigorous data privacy standards and bias prevention protocol, AI is capable of dramatically impacting multiple facets of drug addiction information including primary prevention of substance misuse and diagnosis, treatment, harm reduction, and the broader constellation of hazards associated with usage.

Recommendations

Based on the findings of this research, the following recommendations are made;

1. Having gained the knowledge that AI technology has the potential to prevent drug use and abuse among the youths, it is now imperative to integrate the technology and tailor it to the field of information generation and dissemination about drug abuse.
2. The government and critical stakeholders in the field of drug prevention and administration should collaborate with the aim of making the AI infrastructure available and functional.
3. Institutions charged with the regulation of ethical stands should ensure that ethical framework are put in place to avoid misuse of AI tools.

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