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An Evidence-Based Analytical Study on Capability of ChatGPT in Advanced AI-Based Patient Drug Counseling

Kaipa Sushma[1,*], Balyam Nagalakshmi[1]

Abstract

The application of ChatGPT in providing drug counseling to patients offers the best approach to enhancing policies of healthcare support in decision-making. ***Aim and Objectives:*** *The present study mainly involves an evaluation of the capability of ChatGPT in the management of drug counseling among patients suffering from various metabolic disorders.* ***Methodology:*** *The present study was a community-based interventional study conducted for a period of 12 months from October 2023 to October 2024 among 666 patients residing in the Kadapa region, Andhra Pradesh, India. All the prescriptions were analyzed in detail for implementing AI-based tools in the promotion of advanced patient drug counseling services.* ***Statistical Analysis:*** *Microsoft Excel was used for recording and analyzing the data of recruited subjects and calculating mean, standard deviation, etc. Prism Graph Pad software version 10 will be used for descriptive statistics, P value was calculated for the present study for statistical significance.* ***Conclusion:*** *By leveraging and monitoring natural language processing, ChatGPT provides real-time assistance in the promotion of advanced drug counseling services. Furthermore, it contributes to patient education, improving understanding and medication compliance.*

Keywords: Chat GPT, drug counseling, Prism Graph Pad software, Hartwig scale, supporting lifestyle modifications

INTRODUCTION

ChatGPT can be a helpful resource in drug counseling by providing information, support, and tools for those struggling with substance use or seeking to support others. Here's how Chat GPT might assist in drug counseling [1, 2]:

Education and Information

Substance Facts: Providing detailed information about specific drugs, their effects, risks, and potential consequences. Treatment Options: Explaining various types of treatments like inpatient rehab, outpatient programs, medication-assisted treatments, or counseling approaches. Withdrawal Symptoms: Informing about common withdrawal symptoms and strategies to manage them safely [3].

***Author for Correspondence**
Kaipa Sushma
E-mail: 9398shush@gmail.com

Pharm D. Intern, Department of Pharmacy Practice Annamacharya College of Pharmacy, Rajampet, Andhra Pradesh, India

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- *Emotional Support:* Nonjudgmental Listening: Acting as a safe space for individuals to express feelings or struggles. Encouragement: Motivating users to take steps toward recovery or seek professional help [4, 5].
- *Stress Management Tips:* Offering relaxation techniques, mindfulness exercises, or coping strategies for anxiety and cravings [5].
- *Harm Reduction:* Offering guidance on harm reduction strategies (e.g., how to use substances more safely or find needle exchange programs). Providing overdose prevention tips, like information on naloxone (Narcan) usage [6, 7].

1. *Goal Setting and Accountability:* Helping individuals set recovery goals and track progress. Providing reminders and encouragement for therapy appointments, group meetings, or self-care activities [8].
2. *Crisis Intervention (Limitations Apply):* Immediate Guidance: Offering information about crisis resources, such as hotlines or emergency care. Connecting to Professionals: Recommending local counselors, addiction specialists, or rehabilitation centers [8, 9].
3. *Aim:* The present study is an analytical study to assess the capability of Chat GPT in advanced AI-based patient drug counseling services.

OBJECTIVES

1. To assess the impact of Chat GPT in advanced AI-based patient drug counseling services.
2. To evaluate the outcomes of Chat GPT in advanced AI-based patient drug counseling services.

METHODOLOGY

The present study is a prospective, observational, and interventional study that was carried out to analyze and evaluate the capability of Chat GPT in advanced AI-based patient drug counseling services.

Method of Collection of Data and Study Procedure

The data was collected from the patients who are suffering from various metabolic disorders/diseases residing within Kadapa, Andhra Pradesh, India through personal interviews and medication history reviews [10–13].

Confidence Level:	**99%**	
Margin of Error:	**5**	
Population Proportion:	**50**	**Use 50% if not sure**
Population Size:		**Leave blank if unlimited population size.**
Calculate		

Study Site

Kadapa population, Pin-code: 516001, Andhra Pradesh, India (community-based).

Study Duration

The present study was conducted for a period of 12 months from October 2023 to October 2024.

Study Design

It is a prospective, observational, as well as interventional study.

Sample Size

The estimated sample size ranges between 400–700 for the present study. Sample size calculation with sample size calculator:

Sample Size: 666

This means 666 or more measurements/surveys are needed to have a confidence level of 99% that the real value is within ±5% of the measured/surveyed value.

STUDY CRITERIA

Inclusion Criteria

1. Patients who are willing to participate in the study.

2. Patients who have metabolic disorders (diabetes, hypertension, PCOD, and thyroid disorders).
3. Patients above 18 years, adults & geriatrics.

Exclusion Criteria

1. Patients who are not willing to participate in the study.
2. Patients who are unable to fill out questionnaires (psychiatric atients).
3. Patients with breastfeeding, pregnancy, and pediatrics.

MATERIALS (ANNEXURES) USED

AI-Based tool: Chat GPT

- *Statistical Analysis:* Microsoft Excel is used for recording and analyzing the data of recruited subjects and by calculating mean, standard deviation, etc. Prism Graph Pad software version 10 was used for descriptive statistics, P value will be calculated for the present study for statistical significance (10–13).

Results and Discussion

The study population of 666 patients was analyzed based on various demographic, behavioral, and health-related parameters (Tables 1–6).

Table 1. Distribution of study patients by gender.

Status	Total	Percentage
No. of male patients	452	67.867
No. of female patients	214	32.132
Total no. of patients	*666*	*100*

Table 2. Distribution of study patients by literacy.

Status	Total	Percentage
No. of literates	71	10.66
No. of illiterates	595	89.33
Total	*666*	*100*

Table 3. Distribution of study population by personnel behavior.

Status	Total	Percentage
Alcoholic	81	12.16
Smoking	94	14.11
Tobacco Chewing	6	0.900
Alcoholic+Smoking	78	11.71

Table 4. Distribution based on allergies.

Status	Number	Percentage
No. of allergic patients	98	14.71
No. of non-allergic patients	568	85.28
Total	*666*	*100*

Table 5. Distribution of Patients according to their current health status.

Type of Disease/Disorder	No. of Patients	Percentage
T1DM	126	18.91
T2DM	109	16.36
Hypertension	196	29.42

Hypotension	21	3.153
PCOD	85	12.76
Hyperthyroidism	75	11.26
Hypothyroidism	54	8.108
Total	*666*	*100*

Table 6. AI tool-based drug counseling.

Patient Counselling	**Patient Considered**		**Patient Feedback**					
	n	***%***	***Positive***		***Negative***		***Neutral***	
			n	*%*	*n*	*%*	*n*	*%*
T1DM	126	18.91	126	18.91	00	00	00	00
T2DM	109	16.36	109	16.36	00	00	00	00
Hypertension	196	29.42	196	29.42	00	00	00	00
Hypotension	21	3.153	21	3.153	00	00	00	00
PCOD	85	12.76	85	12.76	00	00	00	00
Hyperthyroidism	75	11.26	75	11.26	00	00	00	00
Hypothyroidism	54	8.108	54	8.108	00	00	00	00
Total	*666*	*100*	*666*	*100*	*00*	*00*	*00*	*00*

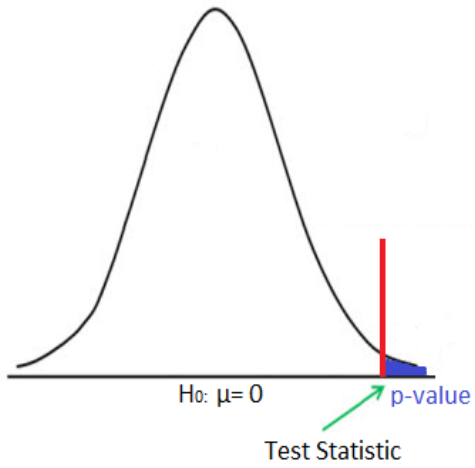

Figure 1. Representing P-Value.

Test Statistic: -1

Sample Size: 666

Test Type: Left-tail (Ha: μ

Significance Level, α: 25%

Compute p-value

p-value: 0.15865525393145707 or 15.865525393145708%

The p-value is statistically significant because it shows that we can reject the null hypothesis (claimed hypothesis) (Figure 1).

DISCUSSION

Applications of ChatGPT in Drug Counseling for Metabolic Disorders:

1. *Education and Awareness:*
   - *Drug Information:* Explaining medications commonly used in metabolic disorders, such as metformin, GLP-1 agonists, or statins, including their benefits, potential side effects, and proper use.
   - *Lifestyle Integration:* Offering guidance on how medication works alongside lifestyle changes like diet, exercise, and stress management to improve metabolic health [14, 15].
2. *Improving Adherence to Treatment:*
   - *Reminders and Tips:* Providing tools for medication adherence, such as setting reminders or addressing concerns about missing doses.
   - *Behavioral Strategies:* Suggesting strategies to overcome barriers to adherence, like managing side effects or simplifying complex regimens [16].
3. *Supporting Lifestyle Modifications:*
   - *Nutrition Advice:* Offering general dietary recommendations tailored to metabolic disorders (e.g., low-glycemic diets for diabetes).
   - *Exercise Tips:* Encouraging sustainable physical activity habits, tailored to individual fitness levels and conditions.
   - *Weight Management:* Guiding users on safe and effective weight management strategies in conjunction with their treatment [17].
4. *Motivational Support:*
   - *Behavioral Counseling:* Supporting habit-building and motivating users to make healthy choices.
   - *Managing Setbacks:* Helping users cope with relapses or challenges, promoting resilience and a focus on long-term goals [18].
5. *Harm Reduction and Safety:*
   - *Drug Interactions:* Providing alerts about possible drug interactions, especially for patients on multiple medications.
   - *Hypoglycemia Awareness:* Educating users on recognizing and managing risks like low blood sugar when using insulin or other glucose-lowering medications [20].
6. *Crisis Support and Referral Emergency Guidance:* Advising patients to seek immediate care if severe symptoms (e.g., ketoacidosis or dangerously high blood sugar) occur [20].

CONCLUSIONS

In summary, Chat GPT can be helpful in drug counseling, but it should not be used in place of expert care; rather, it should be considered an adjunct. Its advantages include facilitating goal setting and accountability, offering easily accessible information, emotional support, and harm reduction techniques. ChatGPT can act as a nonjudgmental resource by guiding users to the right professional services and providing them with helpful advice.

Effective drug counseling, however, necessitates individualized treatment programs, compassion, and the knowledge of qualified specialists to handle the intricate psychological, emotional, and physical components of substance use disorders. ChatGPT works best as an initial support tool, assisting people in connecting with professional resources, staying motivated, and obtaining accurate information.

Limitations

Restrictions of Chat GPT in this situation.

1. *Inadequate Medical Knowledge:* ChatGPT is not a medical expert and should not be used to replace medical advice because it is unable to diagnose or prescribe.
2. *Personalization Gap:* Because metabolic disorders differ greatly from patient to patient, ChatGPT is unable to take into consideration personalized needs or medical histories.
3. *Hazard of Inaccurate Information:* Advice from ChatGPT may result in improper behavior if it is misunderstood or overlooked.
4. *Crisis Situations:* ChatGPT is ill-prepared to manage medical crises or offer on-the-spot clinical assistance.

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