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Efficacy and Safety of Doctor Decha's Cannabis Oil on Sleep Quality, Quality of Life and Glycemic Control in Patients with Type 2 Diabetes: A Prospective Controlled Clinical Study

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ABSTRACT

Cannabis has been increasingly investigated as an adjunctive therapy for chronic conditions due to its potential effects on sleep, well-being and metabolic regulation, but clinical evidence for patients with type 2 diabetes remains limited. This prospective controlled clinical study evaluated the efficacy and safety of Doctor Decha's cannabis oil on sleep quality, quality of life and glycemic control in patients with type 2 diabetes at Kamphaeng Phet Hospital. Fifty eight patients aged 30–70 years diagnosed with type 2 diabetes mellitus were allocated into two groups: the intervention group received 0.15 mL of Doctor Decha's cannabis oil orally once daily at bedtime for three months, while the control group received standard care according to hospital protocols. Sleep quality (Pittsburgh Sleep Quality Index, PSQI), quality of life (WHOQOL-BREF) and glycated hemoglobin (HbA1c) were assessed at the baseline and after treatment. Safety was monitored through liver and kidney function tests and adverse event reporting. Results showed significant improvements in the intervention group. Mean PSQI score decreased from 10.14 ± 2.22 to 4.45 ± 0.91 (within-group $p < 0.001$), while the WHOQOL-BREF score improved from 0.85 ± 0.08 to 0.96 ± 0.06 ($p < 0.001$) including physical, psychological and social domains (between-group $p < 0.05$). HbA1c declined from 9.21 ± 1.61% to 8.53 ± 1.72% ($p < 0.05$). Between-group differences were not significant and no serious adverse events or abnormal liver or kidney functions were detected. Doctor Decha's cannabis oil was safe and effectively improved sleep and quality of life, with modest glycemic benefits. However, a larger sample size with a longer trial period would further confirm the results.

Keywords: Cannabis oil, Sleep quality, Blood sugar, Diabetes

Introduction

Diabetes mellitus is a chronic and progressive metabolic disorder characterised by elevated blood glucose levels resulting from impaired insulin secretion, insulin action or both.[1] Globally, its prevalence has reached epidemic proportions, with over 589 million adults affected in 2024 and projections indicating an increase to over 853 million by 2050.[2] This growing burden is especially pronounced in countries such as Thailand, where lifestyle changes and urbanisation have contributed to an increasing incidence of type 2 diabetes.[3] The disease is associated with serious complications, including cardiovascular diseases, neuropathy and nephropathy, which significantly impair patients' quality of life and impose substantial economic burdens on healthcare systems and families.[4, 5] Beyond its physical manifestations, diabetes exerts a profound impact on mental health and daily functioning. High rates of depression, anxiety and sleep disturbances among diabetic individuals further exacerbate disease management challenges and worsen metabolic outcomes.[6, 7]

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Sleep disorders, such as insomnia and obstructive sleep apnea, are particularly prevalent in this population and have been shown to impair glucose metabolism, thereby creating a vicious cycle of deteriorating health.[8, 9] These multifaceted effects culminate in reduced well-being and diminished adherence to therapeutic regimens, highlighting the need for comprehensive treatment approaches that address both physiological and psychosocial dimensions.[10] Current standard therapies for diabetes primarily focus on glycemic control through pharmacological agents and lifestyle modification; however, these approaches are often limited by adverse side effects, incomplete symptom relief and insufficient impact on associated mental health issues.[11, 12] These limitations have stimulated growing interest in complementary and integrative treatments, including the use of traditional herbal medicines.[13] Cannabis is a medicinal and psychoactive plant in the family Cannabaceae, mainly represented by *Cannabis sativa* L. and *Cannabis indica* Lam. The biologically active compounds, primarily found in the flowers, leaves and seeds, include cannabinoids such as Δ*9*-tetrahydrocannabinol (THC) and cannabidiol (CBD).[14] Cannabis has been used for centuries to alleviate pain, reduce inflammation and improve sleep quality. Cannabis flowers have traditionally been used in Thai formulations for insomnia, reflecting their high cannabinoid content and therapeutic potential.[15] Modern research has demonstrated that phytocannabinoids interact with the endocannabinoid system, regulating metabolic processes such as appetite, glucose homeostasis and circadian rhythms.[16, 17] These findings suggest that cannabis offers promise as an adjunctive therapy for metabolic disorders, including diabetes.[18, 19] The phytocannabinoids found in cannabis interact with the endocannabinoid system, influencing appetite regulation, glucose homeostasis and circadian rhythms, making it a promising candidate for adjunctive therapy for diabetes.

Doctor Decha's formula (DTAM Ganja Oil) consists of two primary

ingredients: cannabis extract and coconut oil. This preparation is manufactured in a World Health Organization Good Manufacturing Practices (WHO GMP) certified herbal medicine facility, ensuring that quality and safety standards. Traditional cannabis oil preparation, standardised for active cannabinoid content, has been utilised in Thailand for managing pain, anxiety and sleep disturbances.[18-20] However, despite its anecdotal success, scientific evaluations of its efficacy and safety in diabetic populations remain limited. Type 2 diabetes has a complex symptom profile of disrupted sleep and psychosocial stressors. This study assessed the impact of Doctor Decha's cannabis oil on sleep quality, quality of life, blood glucose regulation and safety in patients with type 2 diabetes. Comprehensive clinical data are critical to support the integration of traditional remedies into modern clinical practice, potentially offering a holistic approach to improving outcomes in this growing patient population.

Materials and Methods

Study design and setting

This prospective, open label, controlled clinical trial was conducted at Kamphaeng Phet Hospital, Thailand (16.4828° N, 99.5150° E) between September and November 2023. Ethical approval was obtained from the hospital's institutional review board No. 24/2566 (ID 04-05-166T) and informed consent was obtained from all participants before enrollment, as shown in Figure 1.

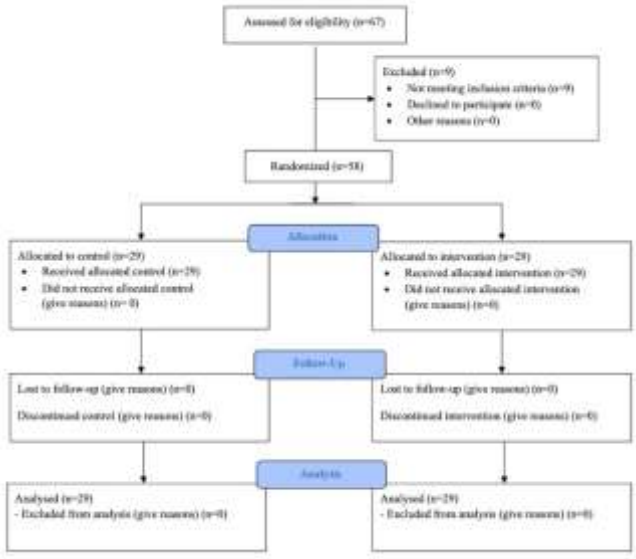

Figure 1: Consort flow diagram of study design and setting

Participants

The study included 58 adult patients diagnosed with type 2 diabetes mellitus who were receiving treatment at the diabetes clinic of Kamphaeng Phet Hospital. Inclusion criteria were age between 30 and 70, stable glycemic control and willingness to participate in the study. Exclusion criteria included pregnancy, lactation and a history of substance abuse. Participants were considered eligible if they had been diagnosed with type 2 diabetes mellitus by a healthcare provider, were between 30 and 70 years of age, were willing to participate and provide written informed consent and had no known history of allergic reactions to cannabis or its compounds. Eligibility also required normal kidney function (eGFR $\geq$ 60 mL/min/1.73 m^2) with no evidence of liver dysfunction, as well as a history of insomnia lasting more than one month, as determined by a Pittsburgh Sleep Quality Index (PSQI) score greater than 5, with the assessment conducted by a licensed Thai traditional medicine physician. Participants were excluded if they were pregnant or breastfeeding, had a history of psychiatric disorders, or presented with severe hepatic or renal impairment. Individuals currently taking medications that could interfere with sleep quality assessments, as well as those with evidence of substance abuse, were also excluded.

Intervention

Fifty eight adult patients with type 2 diabetes mellitus were randomly assigned into two groups, with 29 participants in each group. The experimental (treatment/intervention) group received Doctor Decha's cannabis oil (DTAM Ganja Oil), containing two primary ingredients as cannabis extract and coconut oil. This formulation was produced in a herbal medicine manufacturing facility, certified by the World Health Organization Good Manufacturing Practice (WHO GMP), ensuring adherence to quality and safety standards. The cannabis oil was standardised to contain a defined ratio of tetrahydrocannabinol (THC) and cannabidiol (CBD). The cannabis oil dose was administered once nightly at bedtime: female participants received 3 drops (≈0.15 mL) and male participants received 5 drops (≈0.25 mL). The equivalence in mL was based on the dropper calibration (1 drop ≈ 0.05 mL). Dose adjustments were permitted for tolerability; 0 participants required escalation/reduction and tolerance. Participants were screened for a history of substance use disorder before enrollment and monitored for signs of misuse or dependence throughout the study, with adverse events recorded using a standardised reporting form.

Data collection

Data were collected at the baseline (before the start of the intervention) and at the end of the three-month trial period. Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI), which evaluates components such as sleep duration, sleep disturbances and daytime dysfunction.[21] Quality of life was assessed using the World Health Organization Quality of Life (WHOQOL) questionnaire.[22] Fasting blood sugar levels were measured using standard laboratory procedures, with overall health evaluated by liver and kidney function tests [alanine aminotransferase (ALT),[11] aspartate aminotransferase (AST), blood urea nitrogen (BUN)[23] and creatinine (Cr)]. The ALT, AST,[14], BUN[23] and Cr laboratory tests were performed at the baseline (before the intervention) and again after the three-month intervention period to monitor safety. Blood samples were obtained via venipuncture from the antecubital vein by trained medical personnel using standard clinical procedures.

Statistical analysis

Data were analysed using descriptive and inferential statistics. Continuous variables were expressed as mean ± standard deviation and compared using paired t-tests. Categorical variables were expressed as frequencies and percentages and compared using chi-square tests. A p-value of < 0.05 was considered statistically significant.

Results and Discussion

Baseline characteristics

Fifty eight patients with type 2 diabetes were enrolled in the study, with a mean age of 55 ± 10 years. Most of the participants were female (63.8%) and the mean duration of diabetes was 10 ± 5 years. Baseline characteristics, including glycemic control and sleep quality, were comparable across the participants (Table 1). The baseline demographic characteristics of the participants reflected typical profiles seen in type 2 diabetes populations worldwide and were dominated by middle aged adults with a longstanding history of the disease.[11] The higher proportion of female participants aligned with epidemiological data indicating higher diabetes prevalence among women in certain regions, possibly influenced by hormonal and lifestyle factors.[24] The average disease duration of 10 years suggested that many patients were experiencing some degree of diabetic complications or comorbidities, which commonly develop with prolonged hyperglycemia.[25] This is an important consideration since longstanding diabetes is often associated with deteriorated sleep quality and increased psychological distress, further complicating its management.[26]

Sleep quality

In the experimental group (n = 29), all the participants showed improvement in insomnia symptoms after three months of continuous administration of Doctor Decha's cannabis oil. The mean PSQI score significantly decreased from 10.14 ± 2.22 at the baseline to 4.45 ±

0.91 post-intervention, indicating a substantial enhancement in sleep quality ($p < 0.001$). By contrast, in the control group (n = 29), only 3 participants (10.34%) reported improved sleep quality, with the mean PSQI score decreasing from 8.90 ± 1.84 to 8.83 ± 1.81 over the three-month trial period. Reduction in sleep disturbance scores in the control group reached statistical significance ($p < 0.05$), albeit at a smaller effect size compared to the experimental group. Detailed findings are presented in Table 2.

Table 1: Baseline demographics and clinical characteristics of the participants

Data	Experimental group (n = 29)	Control group (n = 29)
Sex	**n / %**	**n / %**
Male	11 / 37.93	10 / 34.48
Female	18 / 62.06	19 / 65.51
Age (year)		
21-40	3 / 10.34	5 / 17.24
41-60	14 / 48.27	12 / 41.37
61-80	12 / 41.37	12 / 41.37
Mean ± SD	57.97 ± 13.89	53.38 ± 12.91
Weight (kg)		
40-49	3 / 10.34	4 / 13.79
50-59	5 / 17.24	4 / 13.79
60-69	2 / 6.89	5 / 17.24
> 70	19 / 65.51	16 / 55.17
Mean ± SD	69.38 ± 14.58	71.48 ± 18.11
Height (cm)		
140-149	1 / 3.44	0 / 0
150-159	12 / 41.40	15 / 51.72
160-169	8 / 27.58	9 / 31.03
> 170	8 / 27.58	5 / 17.24

Table 2: Effect of Doctor Decha's cannabis oil on sleep quality in type 2 diabetic patients

Output	Experimental group (n = 29)	Control group (n = 29)	p-value
Sleep quality	**n ± SD**	**Mean ± SD**	
Before	10.14 ± 2.22	8.90 ± 1.84	<0.001*
After	4.45 ± 0.91	8.83 ± 1.81	
p-value	< 0.001*	0.752	

* $p < 0.05$

Quality of life in type 2 diabetic patients

In the experimental group (n = 29), participants demonstrated a statistically significant improvement in quality of life after three months of continuous use of Doctor Decha's cannabis oil. The mean quality of life (QOL) score increased from 0.85 ± 0.08 at the baseline to 0.96 ± 0.06 after the intervention ($p < 0.001$). By contrast, the control group showed a non-significant improvement, with the mean score increasing from 0.86 ± 0.13 at the baseline to 0.89 ± 0.12 after the three-month trial period. Detailed results are presented in Table 3.

Table 3: Quality of life scores in type 2 diabetic patients

Output	Experimental group (n=29)	Control group (n=29)	p-value
Quality of life	**Mean ± SD**	**Mean ± SD**	
Before	0.85 ± 0.08	0.86 ± 0.13	0.005*
After	0.96 ± 0.06	0.90 ± 0.12	
p-value	< 0.001*	0.809	

* $p < 0.05$

Blood sugar levels in type 2 diabetic patients

In the experimental group (n = 29), the mean HbA1c level significantly decreased after three months of continuous administration of Doctor Decha's cannabis oil. HbA1c level reduced from 9.21 ± 1.61% at the baseline to 8.53 ± 1.72% post-intervention, showing a statistically significant difference ($p < 0.027$). In the control group, the HbA1c levels changed from 8.97 ± 2.03% to 9.23 ± 2.01%. The between-group comparison revealed no statistically significant difference in HbA1c levels after the intervention ($p > 0.05$). Detailed results are presented in Table 4.

Table 4: Glycated hemoglobin (HbA1c) levels in type 2 diabetic patients

Output	Experimental group (n = 29)	Control group (n = 29)	p-value
Before	9.21 ± 1.61	8.97 ± 2.03	0.159
After	8.53 ± 1.72	9.23 ± 2.01	
p-value	0.027*	0.131	

* $p < 0.05$

Baseline equivalence in glycemic control and sleep quality among participants is crucial for ensuring that any post-intervention changes can be attributed to the treatment rather than preexisting differences. Comparable baseline characteristics enhance the internal validity of the study and align with best practices in clinical trial design.[27] Previous studies demonstrated that sleep disturbances were both a consequence and a contributing factor to poor glycemic control.[28] Therefore, addressing sleep quality alongside glucose regulation is vital for holistic diabetes management. The baseline data confirmed the need for interventions targeting multiple aspects of health, such as the use of cannabis oil in this study. Bioactive cannabinoids, such as THC and CBD, exert their effects primarily through interaction with the endocannabinoid system (ECS), which plays a critical role in regulating glucose metabolism, energy homeostasis, appetite and circadian rhythms, thereby influencing both metabolic and neuropsychological functions.[29, 30] Cannabinoids such as CBD have anxiolytic and sleep-promoting properties, which improve sleep quality and reduce psychosocial stress in patients with type 2 diabetes.[31, 32] Cannabis oil serves as an adjunctive intervention through these multifaceted mechanisms that addresses both physiological and psychological aspects of diabetes management. The demographic and clinical baseline characteristics underscored the representativeness of the participants and established a solid foundation for evaluating the efficacy and safety of Doctor Decha's cannabis oil formula in improving diabetes-related outcomes. The study results suggested that Doctor Decha's cannabis oil effectively improved sleep quality and regulated blood sugar levels in diabetic patients. The improvement in sleep quality was attributed to the sedative and anxiolytic properties of cannabinoids, which help reduce sleep disturbances and promote restful sleep.[16] Better sleep quality contributes to well-being and positively impacts glycemic control.[33]

The observed enhancement in sleep quality aligned with the existing literature, indicating the sedative and anxiolytic effects of cannabinoids. Babson, Sottile and Morabito (2017)[16] reported that cannabinoids modulate sleep architecture by reducing sleep latency and increasing slow-wave sleep, thereby promoting restorative rest. This is particularly relevant for type 2 diabetic patients, who frequently suffer from insomnia and fragmented sleep due to metabolic dysregulation and associated psychological stress.[26] Improved sleep quality has broader implications beyond restfulness, as it plays a pivotal role in metabolic homeostasis. Spiegel et al. (2005)[34] demonstrated that sleep deprivation negatively impacts glucose metabolism and insulin sensitivity, suggesting that interventions which improve sleep also aid in glycemic control. Therefore, the improvements noted in this study contribute to better type 2 diabetes management.

Safety profile

The liver and kidney function tests confirmed the safety of cannabis oil use. No significant changes were observed in ALT, AST, BUN and Cr levels from the baseline to the end of the study. No serious adverse events were reported among the participants, who well-tolerated the intervention, with results shown in Table 5. The anxiolytic properties of cannabinoids reduce comorbid anxiety and stress, which are known to impair sleep and exacerbate glycemic variability.[35, 36] By alleviating these symptoms, Doctor Decha's cannabis oil broke the vicious cycle between poor sleep, stress and metabolic imbalance. The study results were promising, but the individual variability in response to cannabis-based treatments should also be considered. Potential side effects

include dizziness, dry mouth, fatigue, changes in appetite, altered mood and, in some cases, transient cognitive impairment or mild cardiovascular effects.[32, 37-39] Continuous monitoring is recommended to ensure safety and tolerability.

Further studies with larger sample sizes and longer follow-up periods are warranted to confirm these findings and elucidate the underlying mechanisms. Enhancements were observed in the domains of physical health, psychological well-being and social relationships, indicating broad benefits across multiple facets of daily functioning. The marked improvement in QOL among the participants corresponded with growing evidence that holistic approaches addressing both physical symptoms and psychological factors substantially benefit individuals with chronic diseases such as diabetes.[40, 41] The multifactorial nature of diabetes often leads to impairments in physical health, mental well-being and social functioning and addressing these interrelated areas is critical for enhancing QOL.[42] Cannabinoids have been reported to exert positive effects on mood and anxiety, which explained the improvements in psychological well-being and social relationships reported in this study.[43] By alleviating pain, reducing anxiety and improving sleep quality, Doctor Decha's cannabis oil helped patients engage more fully in social and daily activities, contributing to enhanced life satisfaction.

These findings concurred with previous research, highlighting the potential of cannabis-based interventions to improve QOL in individuals with chronic illnesses.[44] However, caution is warranted due to the variability in individual responses and the current lack of standardised dosing guidelines and long-term safety data.[45]

Table 5: Safety indicators in type 2 diabetic patients

Safety indicators	Experimental group)n = 29(	Control group)n = 29(	p-value
Adverse events)n, %(	2)10.00%(	1)5.00%(	0.521
Severity of adverse events)Mean ± SD(	1.20 ± 0.40	1.00 ± 0.30	0.412
Discontinuation due to adverse events)n, %(	0)0%(	0)0%(	-

The significant improvements in QOL observed in this study reinforce the potential of integrating traditional cannabis preparations into type 2 diabetes management, addressing both physiological and psychosocial dimensions of patient health. Nevertheless, the psychoactive properties of Δ9-THC may carry a risk of dependence or misuse, as well as potential side effects such as dizziness, dry mouth or mild cognitive impairment.[38] Therefore, careful dosing, medical supervision and monitoring for adverse events are essential to ensure safe and effective use of cannabis-based interventions.[16, 36]

The notable decline in fasting blood glucose (FBG) indicated an improvement in glycemic control, suggesting a beneficial metabolic effect of the intervention. The significant reduction in fasting blood glucose observed in this study concurred with emerging evidence that cannabinoids modulate glucose metabolism. In patients with type 2 diabetes mellitus, cannabinoids such as THC and CBD have been shown to enhance insulin sensitivity, improve peripheral glucose uptake and promote glucose homeostasis, rather than directly stimulating insulin secretion.[29, 46] This metabolic regulation is believed to occur primarily via interactions with the endocannabinoid system, which plays a key role in the regulation of appetite, energy balance and inflammation.[47] The endocannabinoid system modulates peripheral tissues such as adipose tissue, liver and muscle, which are key players in glucose uptake and insulin signaling pathways.[17] Dysregulation of this system has been linked to obesity and insulin resistance, both common precursors to type 2 diabetes.[48] By influencing this pathway, cannabinoids exert beneficial effects on metabolic disorders. The exact mechanisms underlying the hypoglycemic effects of cannabinoids remain uncertain, but some studies have suggested that cannabinoids reduce chronic inflammation and oxidative stress, both implicated in the pathogenesis of insulin resistance.[49] The anxiolytic and sleep-enhancing properties of cannabis indirectly improve metabolic parameters by mitigating stress-induced hormonal imbalances that impair glycemic control.[16] However, variabilities in cannabinoid profiles, dosage and patient characteristics necessitate cautious interpretation. Further large-scale randomised controlled trials are essential to confirm these findings and optimise treatment protocols.[39]

Liver and kidney function tests performed at the baseline and at the end of the three-month intervention revealed no significant changes in key biochemical markers, including alanine aminotransferase, aspartate aminotransferase, blood urea nitrogen and creatinine levels. No serious adverse events were reported during the study period and most of the participants tolerated Doctor Decha's cannabis oil formula well, indicating a favourable safety profile. These findings concurred with accumulating evidence suggesting that cannabis-based therapies, when properly formulated and dosed, pose a low risk of hepatic and renal toxicity.[45] Safety monitoring was performed by assessing liver and kidney function (AST, ALT, BUN, Cr) at baseline and after three months. Similar to the detoxification study of *Croton tiglium* L. seeds, which showed reduced toxicity after traditional processing,[50] these evaluations highlight the importance of ensuring the safety of cannabis oil use in clinical practice. Monitoring liver enzymes such as ALT and AST is critical, as they are sensitive indicators of hepatocellular injury, while BUN and Cr serve as markers of renal function.[51] The absence of significant alterations in these parameters supports the notion that Doctor Decha's formula is safe for short-term use in type 2 diabetic patients. Previous clinical trials investigating medical cannabis in various populations have reported low incidences of severe adverse effects, with most side effects being mild and transient, such as dizziness or dry mouth.[39] This study found no serious adverse events, reinforcing the tolerability of the formula in a diabetic cohort that was possibly more vulnerable to medication-related side effects due to comorbidities. Nevertheless, long-term safety data remain limited and further research is necessary to evaluate the potential cumulative effects and interactions with conventional diabetic medications.[52] Patient education and clinical monitoring are essential to integrate cannabis-based treatments into routine care. These study results contribute to the growing body of literature supporting the safe incorporation of cannabis oil formulations in managing complex chronic conditions such as type 2 diabetes.

Conclusion

This study had several limitations that should be considered when interpreting the findings. First, the sample size was small (n = 29/group), which limited the statistical power and generalizability of the results. Second, the duration of the intervention was only three months; therefore, the long-term efficacy and safety of Doctor Decha's cannabis oil in type 2 diabetic patients remain unclear. Third, the study included a control group, but the trial was open-label and neither participants nor investigators were blinded, possibly introducing a potential bias in the reporting and assessment of the outcomes. Results demonstrated that Doctor Decha's cannabis oil was a beneficial adjunct therapy for type 2 diabetic patients, offering improvements in sleep quality and glycemic control without significant adverse effects. These findings support the integration of traditional medicine approaches into modern healthcare for managing chronic conditions such as type 2 diabetes. However, further research studies with larger sample sizes and extended follow-up periods are recommended to validate these findings and explore the long-term benefits and safety of cannabis oil in type 2 diabetes management.

Conflict of Interest

The author`s declare no conflict of interest.

Authors' Declaration

The authors hereby declare that the work presented in this article is original and that any liability for claims relating to the content of this article will be borne by them.

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