

# Tianeptine “gas station heroin” products: US public health threat or niche substance use?

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## Introduction

-Tianeptine is a pharmaceutical prescribed in some countries for major depressive disorder, anxiety, and drug withdrawal.<sup>1,2</sup> Tianeptine is effective for these indications in nonhuman animals and in diverse patient populations, though the mechanisms responsible for its clinical efficacy are debated.<sup>3-5</sup>

-Although tianeptine structurally resembles tricyclic antidepressants, it is a full agonist at mu opioid receptors (MOR); MOR activity is thought to be necessary for its antidepressant, anxiolytic, and behavioral effects.<sup>6-10</sup>

-In the US, tianeptine is not approved by FDA for any indication.<sup>11</sup> Still, there has been a proliferation of grey market products advertised as containing tianeptine, primarily as dietary supplements branded as “nootropics”.<sup>12</sup> FDA considers these to be illegally marketed and sold, despite not being scheduled federally.

-Media and case reports have noted that tianeptine consumers may rapidly develop tolerance and withdrawal symptoms, with some referring to these products as “gas station heroin.”<sup>13-15</sup> Dependence and addiction are also reported, with naloxone and/or buprenorphine utilized by some physicians.<sup>15-17</sup> Tianeptine use has been documented in recent years as an opioid replacement and anxiolytic adopted nonmedically by consumers.<sup>12,16-17</sup>

**As there are no self-report data from US adults with tianeptine use experience, we aimed to:** determine the demographics, substance use history and use patterns of adults who have used nonmedical tianeptine. We queried respondents about tianeptine doses, effects, conceptualizations and evaluated for DSM-5 substance use disorder for tianeptine.

## Methods

**We conducted a cross-sectional online survey between December 2023 and July 2024 focused on kratom and kava, and other grey market substances.**

-Digital flyers advertising the study and the specific substances of interest (alone or in combination) were distributed on social media.

-Participants were fully informed about the survey prior to voluntary participation; participants were not compensated. The Johns Hopkins University School of Medicine Institutional Review Board approved this study.

## Only 6.3% of survey respondents had ever tried tianeptine.

**Table 1. Demographic, substance use disorder (SUD), and recovery orientation for participants with and without lifetime tianeptine use history**

	No Lifetime Tianeptine Use (n = 347)		Lifetime Tianeptine Use (n = 22)		p
	N	%	N	%	
Age, Mean (SD)	40.5	(12.4)	35.6	(11.1)	0.067
Age first tianeptine use, Mean (SD)	-	-	31.0	(10.9)	-
Non-Hispanic White	314	90.5	18	81.8	0.258
Male	209	60.2	18	81.8	0.136
<b>Employment</b>					0.832
Working full-time, part-time, or student	267	77.0	16	72.7	
Disabled	35	10.1	3	13.6	
Unemployed	24	6.9	2	9.1	
Retired	21	6.1	1	4.6	
<b>Education (N=338 for Full Sample)</b>					0.421
Finished High School / GED	31	9.17	4	18.2	
Some College	71	21.0	5	22.7	
College Degree or Higher <sup>b</sup>	236	69.8	13	59.1	
<b>Past-year annual personal income</b>					0.385
<\$30,000	84	24.2	7	31.8	
\$30,000 to <\$60,000	65	18.7	6	27.3	
\$60,000 to <\$90,000	62	17.9	4	18.2	
>\$90,000	136	39.2	5	22.7	
Ever Medically Diagnosed with SUD	93	26.8	8	36.4	0.120
<b>Believes To Have Ever Had SUD</b>					0.002
A long time ago, but not now	97	28.0	1	4.6	
Recently, but not now	38	10.9	6	27.3	
Currently	70	20.2	9	40.9	
Ever Prescribed Methadone and/or Buprenorphine	28	8.1	6	27.3	0.009
Currently in SUD Recovery	83	23.9	11	50.0	0.007
Current Interested in Recovery	100	28.8	16	72.7	<.001

## The most frequently endorsed tianeptine conceptualizations

included: “potent” (72.7%), “habit-forming” (68.2%), “addictive” (68.2%), “problematic” (59.1%), “too expensive” (59.1%), “is an opioid” (50.0%), and “isn’t regulated across vendors” (50.0%). The same proportion of respondents (36.4%) agreed that tianeptine “should be legal” vs. “probably should be made illegal.”

Only 27.3% endorsed conceptualizations of “therapeutic,” “helpful,” or “a real benefit to my daily life.”

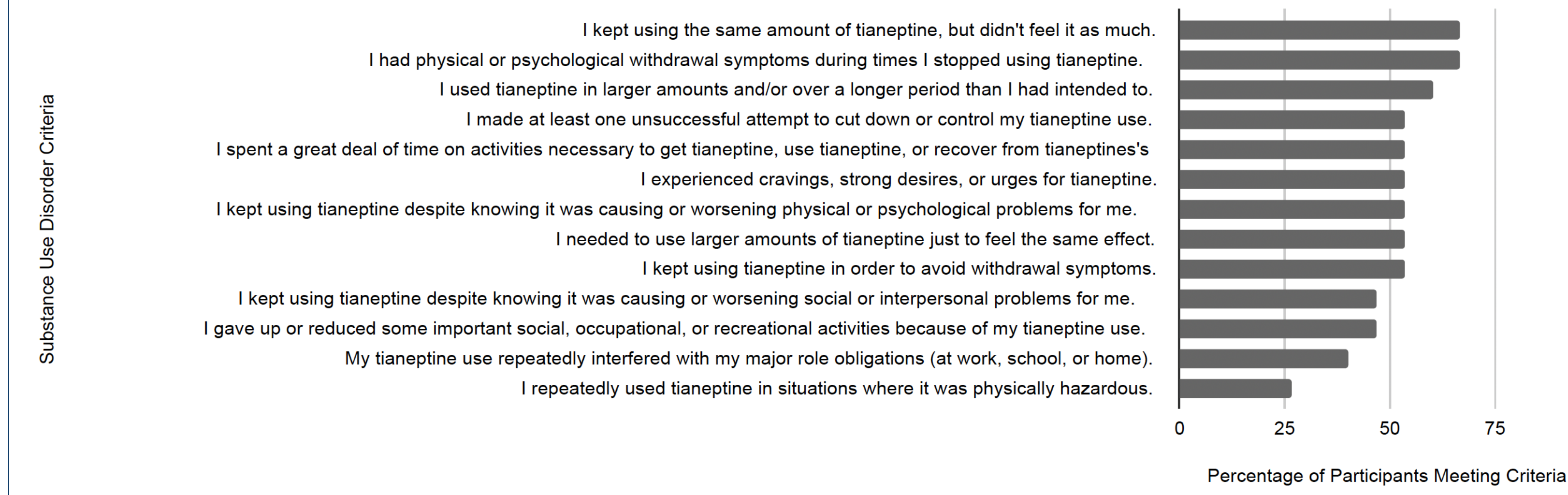
**The full sample had extensive & diverse lifetime substance use history.** After alcohol, caffeine, and vaped nicotine, cannabis and kratom were among the most endorsed substances ever used. **Phenibut**, which can appear in tianeptine products, was used by 72.7% of tianeptine consumers but only 15.6% of those without tianeptine use (p< 0.001).

Statistically significant differences between tianeptine consumers compared to those without tianeptine use (with tianeptine consumers showing *greater rates of use*) included: **e-cigarettes** (p=0.002), **non-prescribed opioids** (p=0.039), **dextromethorphan** (p=0.027), **non-prescribed modafinil** (p=0.004), **prescription Suboxone/Subutex** (p=0.006), **racetams** (p<0.001), **non-prescribed methadone** (p=0.024), & **synthetic cathinones** (p=0.017).

**Table 2. Use patterns, dosing, product forms for respondents who reported lifetime tianeptine use (n=22)**

Tianeptine doses per day (n=18) Mean (SD)	5.9	(12.3)
Tianeptine doses per week (n=18) Mean (SD)	20.3	(21.5)
Number of months tianeptine use within past year (Mean, SD) (n=15)	5.0	(3.23)
Number of days tianeptine use past 30 days (Mean, SD) (n=11)	10.7	(10.3)
<b>Has Used Tianeptine &gt;100 Times</b>	15	68.2
<b>Place of Purchase<sup>a</sup></b>		
Gas station/convenience store	6	27.3
Head/smoke shop	5	22.7
Online US-based vendor	16	72.7
Other <sup>b</sup>	2	9.1
<b>Most frequently used form of tianeptine</b>		
Oral in powder form	12	45.5
Oral in pill form	10	54.6
<b>Dosing units commonly used<sup>a</sup></b>		
Grams	9	40.9
Spoonfuls	1	4.6
Capsules (standard size)	9	40.9
Other	4	18.2
<b>Typical dose</b>		
Grams, Mean (SD) (n=9)	0.94	(0.72)
Capsules, Mean (SD) (n=9)	8.3	(7.53)
<b>Unit of time for tianeptine effects onset (n=19)</b>		
Seconds	2	10.5
Minutes	15	79.0
Hours	2	10.5
<b>Unit of time for tianeptine effects to dissipate</b>		
Minutes	6	27.3
Hours	12	54.6
Unsure (would take more tianeptine before the effects wear off)	4	18.2
<b>Felt acute effects every time (or nearly every time) after use</b>	15	68.2
<b>How soon after you wake is first dose of tianeptine consumed</b>		
Within 5 minutes	6	27.3
6-30 minutes	7	31.8
31-60 minutes	1	4.6
After 60 minutes	8	36.4
<b>Tianeptine dose you would most hate to give up?</b>		
The first one in the morning	8	36.4
All other times of day	14	63.6

**Percentage of Participants Meeting Specific Criteria for a DSM-V Derived Tianeptine Use Disorder**



**DSM-5-derived SUD for tianeptine** for the 15 respondents who reported *past-year use*, 33.3% did not meet SUD criteria; **13.3% met a mild-moderate** diagnostic threshold and **53.3% were severe**. Tianeptine-based SUD symptoms included those related to physical dependence, but also many symptoms suggestive of disordered use.

**Table 3. Effects and use motivations for respondents who reported lifetime tianeptine use (n=22)**

	N	%
<b>Acute tianeptine effects</b>		
Euphoria	14	63.64
Improved mood	14	63.64
Reduced general anxiety	12	54.55
Pain relief/analgesia	10	45.45
Sedation	8	36.36
Reduced social anxiety	8	36.36
Increased energy	8	36.36
Sleepiness	7	31.82
Increased focus	7	31.82
Loss of appetite	5	22.73
Increased productivity	5	22.73
Foggy memory	4	18.18
Other	4	18.18
Reduced tianeptine craving	4	18.18
Slower heart rate	3	13.64
Slower breathing/respiration	3	13.64
Reduced craving for another drug	2	9.09
Increased alertness	2	9.09
Desire to eat	1	4.55
Increased libido/sex drive	1	4.55
<b>Primary reason for using tianeptine</b>		
To achieve a euphoric high	6	27.27
Self-treat depression symptoms	3	13.64
Self-treat anxiety symptoms	3	13.64
Other	2	9.09
As a long-term substitute/replacement for opioids	1	4.55
As a study drug	1	4.55
Because you prefer the tianeptine "high" to "highs" you get from other drugs	1	4.55
Boost energy, stamina, and/or endurance	1	4.55
For recreation, fun, or to relax	1	4.55
Relieve withdrawal symptoms from "nootropics" or "cognitive enhancing" supplements	1	4.55
Relieve withdrawal symptoms from a variety of different drugs	1	4.55
Self-treat long-term pain issues and symptoms (chronic pain management)	1	4.55

## Conclusions

Even among polysubstance consumers with diverse use histories, tianeptine is not widely used. Among those who have used it, many have unfavorable attitudes and evince symptoms related to physical dependence. Among recent consumers, severe SUD for tianeptine was evident. However, to date, there are few US-based case reports on grey market tianeptine use. Some involve use of buprenorphine/naloxone.<sup>17-21</sup> Clinicians are encouraged to add tianeptine to assessment measures and publish instances of use or SUD. Despite media hype, it is unclear if tianeptine will endure in US markets long-term.<sup>17</sup>

## Disclosures

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## References

For references, please scan QR code!



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