

Assessing Pharmacy Student Knowledge of Kratom: The FDA's Newest Opioid

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Background

- Kratom is a tropical tree that contains the natural products of *Mitragyna speciosa*, including the alkaloids (opioids) mitragynine and 7-hydroxy-mitragynine. Kratom has been used for centuries and is part of the culture and tradition of certain geographical areas such as the southern peninsula of Thailand. Historically, kratom leaves are chewed by members of the workforce to reduce fatigue.¹
- Over the last decade, kratom use has expanded overseas and is now available in the U.S. where it is legal in all but six states. Although it cannot be advertised in the U.S. to treat any medical condition, it is frequently used to treat opiate withdrawal, enhance mood, and control pain.² Cases of kratom toxicity, including fatalities, have been reported; however, in most cases, other medications were also involved.³ The pharmacologic effects of kratom are believed to be due to the presence of alkaloids which produce either stimulant or opioid-like effects via their interaction with 5-HT(2A) and mu-opioid subtype receptors, respectively.²
- Due to concerns of abuse and toxicity, in 2014 the Drug Enforcement Administration (DEA) published an informational bulletin that listed kratom on its "Drugs and Chemicals of Concern." Subsequently, in 2016, the DEA announced its intention to place mitragynine and 7-hydroxymitragynine into Schedule I of the Controlled Substances Act.⁴ However, in October 2016, the DEA withdrew its notice of intent and kratom remains legal in the US.⁵
- Despite the controversy surrounding the safety and legality of kratom, the herb has received relatively little attention from scientific/medical journals or the lay press. Anecdotally, it has been our observation that few pharmacists and physicians are aware of kratom or its pharmacologic effects.

Objectives

- To assess pharmacy student knowledge of kratom, a legal botanical substance recently designated as an opioid by the FDA.

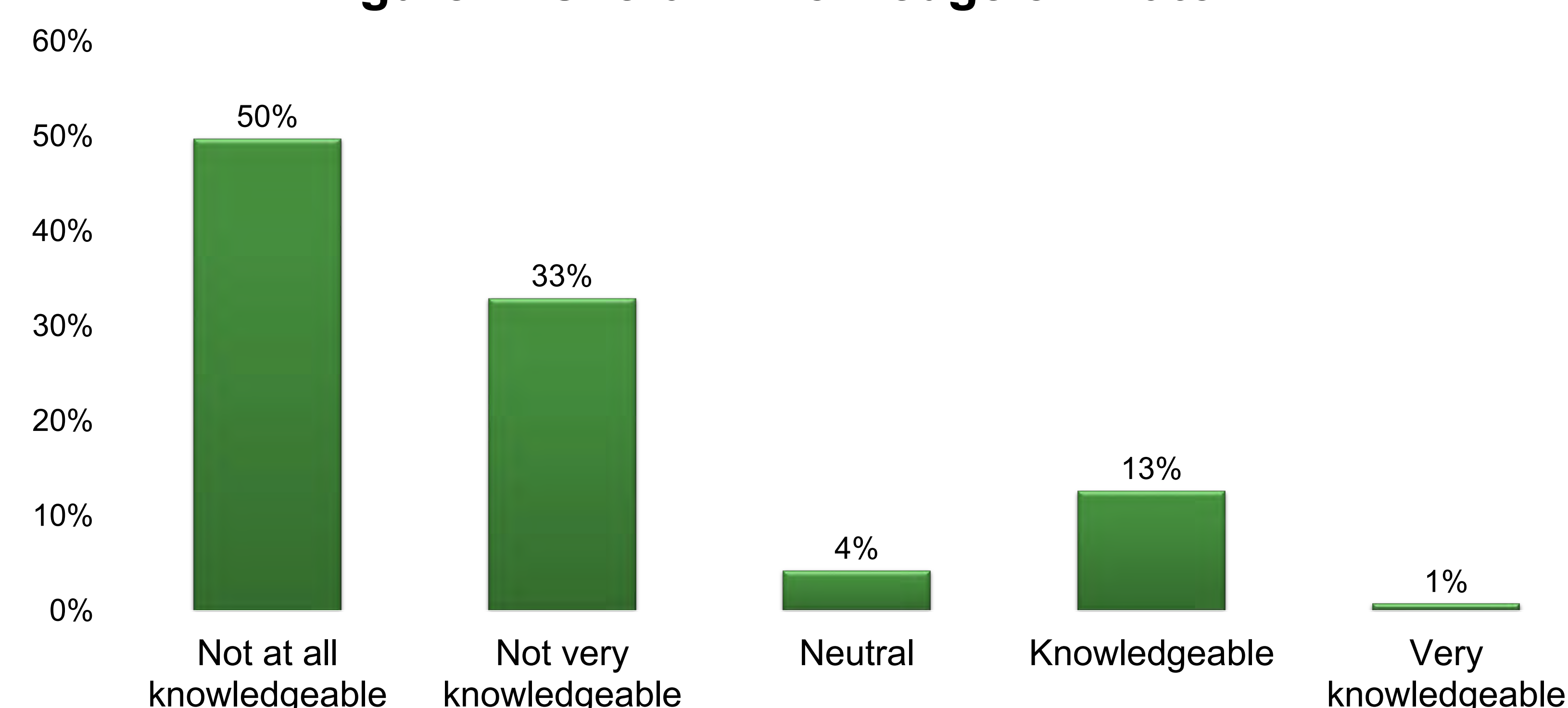
Methods

- An online survey was used to assess P1–P4 pharmacy student knowledge of kratom including medical uses, knowledge source, and clinical effects using Likert-scale and yes/no questions.
- Individuals were considered to "knowledgeable" about kratom if they responded "knowledgeable" or "very knowledgeable" and "not knowledgeable" if they responded "not at all knowledgeable" or "not very knowledgeable".
- Data were analyzed via multiple Chi Square analysis. $P < 0.05$ was accepted as statistically significant. Demographic information was also collected.

Results

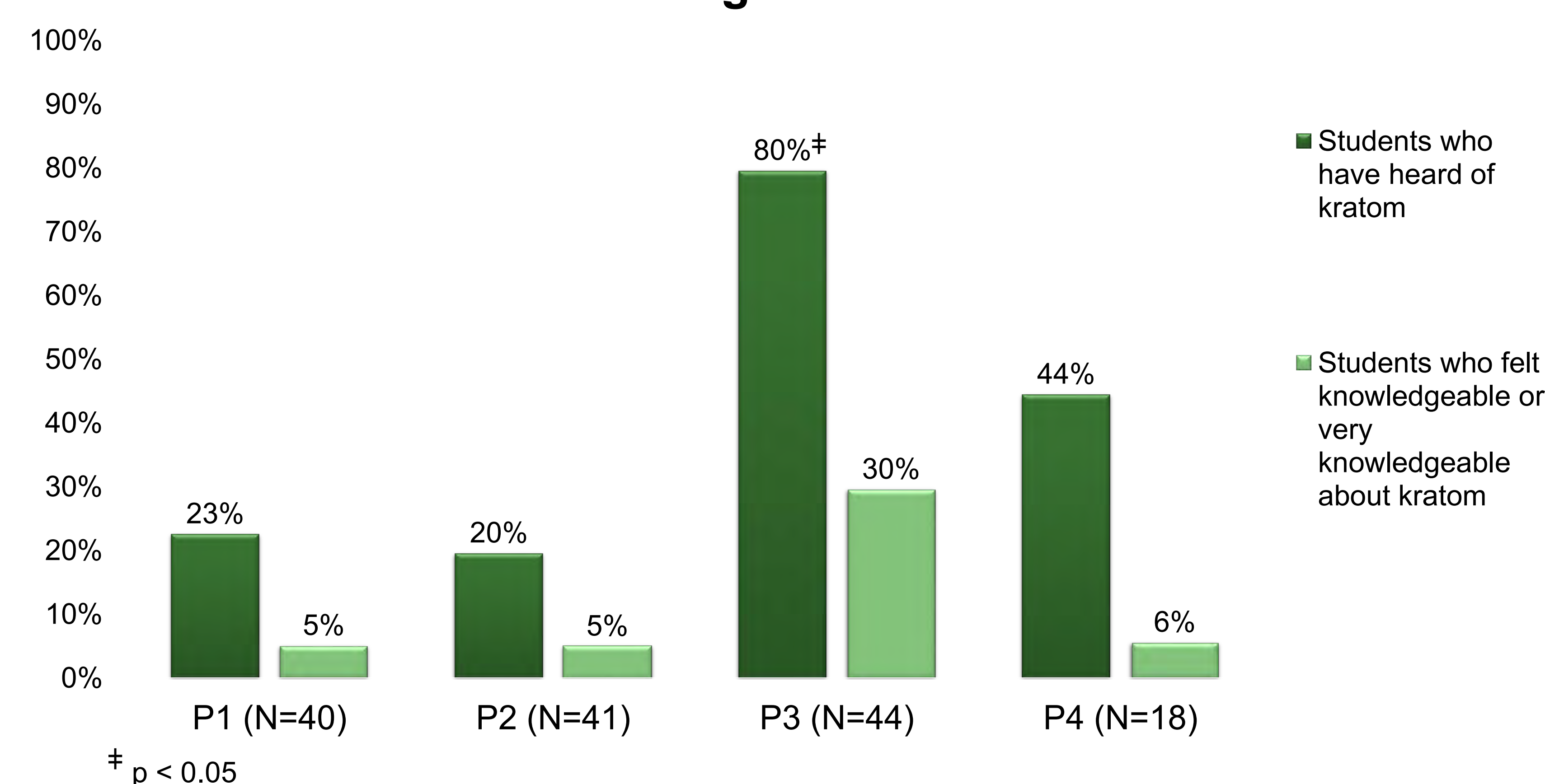
The survey was completed by 143 pharmacy students at UNT SCP; >80% of whom rated themselves as "not at all knowledgeable or not very knowledgeable" of kratom (Figure 1).

Figure 1: Overall Knowledge of Kratom



In contrast, 80% of P3 students reported having heard of kratom, which was significantly greater than P1, P2 and P4 students. However, only 30% of P3 students rated themselves as "knowledgeable or very knowledgeable" about kratom (Figure 2).

Figure 2: Comparison of Student Knowledge of Kratom



Results cont.

- P3 students were significantly more likely to have heard of kratom via pharmacy school curriculum versus P1, P2 and P4 students whose knowledge came from other sources such as lay publications.
- Although kratom is indigenous to Southeast Asia, of the six students who grew up in that region, five had not heard of kratom.



<https://www.usada.org/substance-profile-kratom/>

Implications

- Despite lay press popularity, and a failed DEA ban, most pharmacy students had never heard of kratom.
- Kratom education represents an important teaching opportunity and should be incorporated into pharmacy school curriculums.
- Future studies will assess kratom knowledge in health care students and professionals beyond our university.

References

- Prozialeck WC. Update on the pharmacology and legal status of kratom. *J Am Osteopath Assoc.* 2016;116(12):802-809.
- Warner ML, Kaufman NC, Grundmann O. The pharmacology and toxicology of kratom: from traditional herb to drug of abuse. *Int J Legal Med.* 2016; 130(1):127-38.
- Anwar M, Law R, Schier J. Notes from the field. Kratom (*Mitragyna speciosa*) Exposures reported to poison centers — United States, 2010–2015. *MMWR Morb Mortal Wkly Rep.* 2016; 65:748–749.
- DEA. Schedules of controlled substances: temporary placement of mitragynine and 7-hydroxymitragynine into Schedule I. *Fed Regist.* 2016;81(169):59929-59934. www.gpo.gov/fdsys/pkg/FR-2016-08-31/pdf/2016-20803.pdf. Accessed July 5, 2018.
- DEA. Withdrawal of notice of intent to temporarily place mitragynine and 7-hydroxymitragynine into Schedule I. *Fed Regist.* 2016;81(198):70652-70654. www.gpo.gov/fdsys/pkg/FR-2016-10-13/pdf/2016-24659.pdf. Accessed July 5, 2018.