

K2: Synthetic Marijuana- A NEW Dangerous Drug

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Abstract

K2-Synthetic Marijuana is a dangerous drug being consumed by individuals not aware of the long term medical consequences of the drug. This drug gives the same mimicking effects of marijuana; yet, it's more dangerous and addictive. Laws have been enacted to curb the distribution, possession, and use of this product. This article describes college students' knowledge of K2 and signs/symptoms of the drug being used by their

Statement of the Problem

In her article, "Teenagers Smoking K2 Have Authorities Incensed," Mary King (2010) writes, "K2, the use gives them a more potent "high" than regular marijuana (S. Blake, 2010). K2 will produce in individuals many symptoms including but not limited to paranoia, increased heart rate, loss of consciousness, difficulty in thinking and memory, and brain damage (King, 2010). Dr. Anthony Scalzo, director of the Missouri Regional Poison Control center, reported that teens who experiment with K2 will have pale skin, severe agitation, seizures, elevated heart rate, and severe vomiting ("Fake Weed "K2" can Cause Hallucinations," 2010; "Toxicologist Warning to Parents: Look for Signs of K2—'Fake Marijuana'," 2010).

There has been little data regarding the use and knowledge of K2 among college students. For community leaders, medical professionals, and law enforcement to make knowledgeable decisions about the future, empirical data are needed. The purpose of the study is to assess students' knowledge of the new synthetic marijuana, K2, through their use.

Review of Literature

Clemson University's John Huffman is the scientist credited with creating K2 in the mid 1990's. The organic chemist was researching the effects of cannabinoid receptors on the brain (S. Blake, 2010; Killian, 2010). Upon the discovery of JWH-018, the mixture that gives K2 its potency, Huffman published a book that contained the formula for the compound (Lukachick, 2010). The easily accessible ingredients that cause powerful hallucinogenic effects make K2 extremely popular among young people seeking an alternative legal high to the illegal marijuana, hashish and other cannabis (DeNoon, 2010). Huffman believes the JWH-018 compound was first smoked somewhere in Europe when people began spraying the substance on dried flowers, herbs, and tobacco (S. Blake, 2010).

In the article, "Drug Remains Legal despite Concerns," Brandon Sayers (2009) confirms how Huffman admitted "that one of his students discovered the chemical while studying the effects of pharmaceuticals on the brain. The student named the compound after Huffman's initials, JWH-018" (para. 4).

Noelle Phillips (2009), in her article "Popularity of 'fake weed' Growing," describes how the chemistry professor created the fake cannabinoids that are used to create K2 as part of a class assignment. She said,

Huffman and his students create compounds - known as synthetic cannabinoids - that mimic the effects of marijuana. The creations, he said, are used by other scientists in the pharmaceutical research industry. Huffman started developing the fake cannabinoids about 20 years ago. People in the pharmaceutical industry wanted to learn more about two proteins in the human body that react with THC, the potent, active ingredient in marijuana. Huffman decided to create substances that mimic THC to sell to the pharmaceutical industry. (para. 2 & para. 4)

After Mount Everest, K2 is the second highest mountain on earth. It also holds the distinction of having one of the highest fatality rates for those who attempt to climb it. Who knew that this little talked about mountain located between China and Pakistan would also unknowingly share its name with a new compound known for giving users an intensely dangerous high. K2 is a smokeable incense blend of herbs and spices that have been sprayed with a chemical similar to THC (delta-9-tetrahydrocannabinol) (Fay, 2010; Killian, 2010).

According to King (2010), K2 looks like "crushed potpourri" (para. 3). Some of the ingredients are *Canavalia rosea*, *Clematis vitalba*, *Nelumbo nucifera*, *Pedicularis grandifolia*, *Heimia salicifolia*, *Leonurus sibiricus* *Ledum palustre* and *Calendula* blossoms (U. Blake, 2010). By themselves, these herbs pose no real health risk. However, combined and altered with a synthetic compound and sold in colorful psychedelic and visually stimulating markings, K2 is a dangerous and potentially toxic mixture.

The olive colored K2 mixture looks like the cooking spice dried oregano and is purported to be 10 times greater in potency to THC (Bryner, 2010). It is primarily sold in 3 ounce packages ranging in price from \$20 – 40 per package ("Fake Weed "K2" can Cause Hallucinations," 2010; Lystra, 2010). K2 appeals greatly to teens and adults who are seeking a legal alternative to marijuana (Fay, 2010). This includes individuals who are required to complete mandatory drug testing. The usual dosage is 3-20 milligrams ("What is K2," 2010).

What gives K2 its reputation of being “legal pot” is the presence of THC, the active ingredient in marijuana that bind to the brain’s CB1 receptors and impact the central nervous system (Bryner, 2010). DeNoon (2010) also reports that “Like THC, the active ingredient in marijuana and other forms of cannabis, these synthetic cannabinoids turn on the cannabinoid receptors found on many cells in the body. The brain is particularly rich in the CB1 cannabinoid receptor” (para. 10). What this means is that because of how the body processes cannabinoids, smoking K2 gives the user the same physiological effects as if they were smoking marijuana. This includes feelings of euphoria, increased anxiety, panic and changes in appetite. However, cannabinoids aren’t the only ingredients found in some packages of K2. Since much of K2 is manufactured overseas, it is difficult to determine whether users have the real or fake K2. Lack of regulation of K2 could mean that toxins that cause serious health problems are used. Supporters of the use of K2 argue that those unknown toxins are the real reason why users get sick from K2.

As reported in “What is K2” (2010), the chemical effects of K2 last “much longer when consumed orally than when smoked” (para. 4). In addition, “the effects of JWH-018 produces a very similar effect to THC, but with a much longer duration of naturally occurring THC and JWH-073” (“What is K2,” 2010, para. 5).

Traditionally, K2 “blends are burned in incense pots; however, teens roll the K2 incense in wrappers to make joints, or they smoke it in pipes. When smoked, K2 delivers a high similar to that of marijuana. Users claim it's almost impossible to tell the difference between the two” (King, 2010, para. 3). Users have also been known to smoke K2 in bong and pipes. K2 has an earthy aroma that comes from its botanicals that some believe make it ideal for practices like meditation. Perhaps most significantly, K2 is also undetectable in current drug tests (King, 2010).

Tennies (2012), reported that Huffman, who has been working at Clemson for 50 years, noted that over the years, he and his students have created over 450 varieties of fake cannabinoids that drug companies and schools like Virginia Commonwealth University use in ongoing pharmaceutical research.

Even though he created the compound, Huffman does not encourage the use of it. Dr. Huffman states that “people who use it are idiots.” He has also been quoted as saying “It is like Russian roulette to use this drug. We don't know a darn thing about them for real” (S. Blake, 2010, pg. 2).

“The problem with JWH-018 is that absolutely nothing is known regarding its toxicity or metabolites,” Huffman said. “Therefore, it is potentially dangerous and should not be used” (Sayers, 2009, para. 4).

Methods

The purpose of the study is to assess students’ knowledge of the new synthetic marijuana, K2, through their use. The researcher collected data from questionnaires of students at a university in East Texas.

Participant Selection

The investigator sent an e-mail out to all graduate assistants teaching fitness recreational activities (FRA) regarding the study. At the beginning of each FRA, the graduate assistant (not the researcher) read the consent paragraph and students were invited to complete the survey. FRAs are 2 hours of required university studies physical education courses for all students at this university. Since this is a required course for all students of the university, it will include the whole undergraduate population. Those who do not want to participate have an option of completing a given crossword puzzle within the survey packet. Survey participation does not immediately indicate they have tried K2.

Instrumentation

The questionnaire was developed by Dr. Lavelle Hendricks, a substance use and abuse counselor. The decision to utilize this method was strengthened with the knowledge that authorities in the field of educational research regard questionnaires as valuable instruments in that they are an impersonal method of obtaining data from a vast number of individuals, scattered throughout a sizeable territory.

The questionnaire is one of the oldest types of instruments for the collection of data for research. It is also one of the most frequently used methods of obtaining information. In the construction of the questionnaires used in this study, questions requiring brief responses are used in attempt to increase objectivity and to provide greater accuracy in tabulating responses. The investigators anticipated that questions requiring brief responses would result in more reliable and valid data.

Questions concerning age, gender, and previous health education were included. Additional questions were included for users of K2. Since questions that could be easily answered by the participant were of the utmost importance to the investigator, a “fill in the blank” type of question was used for a majority of the questions. Space was provided to specify additional answers when necessary.

Collection and Treatment of Data

A professional peer reviewer was retained to analyze the data categories to further increase the credibility and conformability of the findings. All phases of this project were subject to scrutiny by an external auditor. Besides her experience with doctoral research, the auditor was chosen due to her low fees and turnaround time.

When questionnaires from student were compiled after one week of dispersal, a spreadsheet was developed for recording the data obtained from the questionnaires. Total frequencies were obtained and percentages were computed for each item on both questionnaires. Ranges were used where numerical answers were requested. Percentages were computed for each range. The tabulations were double checked for each questionnaire for accuracy.

Analysis of the Data

246 students at a university in east Texas returned the questionnaires. Data reveal that 121 participants were male and 125 were female. Age distribution was 18-22years: 126 students; 23-26 years: 109 students; 27 & over: 11 students. In response to "Have you ever had a course/class on drug education," 46% checked yes, 48% marked no and 6% did not answer. Regarding "when they had the course," various answers ranged from middle school to the previous semester. For those that took a course, 17 students reported that it was not required. Responses to "Did it make an impact on your life," indicate that 50% said yes and the 50% stated no. If yes, reasons include more knowledge and awareness concerning drugs.

For the question "What is the active ingredient found in marijuana, 1 student answered baking soda, 13 students marked Lysergic acid diethylamide, 224 students replied Delta 9 tetrahydrocannabinol, 4 responded smoke and 2 students circled acid. Two students did not respond. With the question "What is the drug K2", 241 out of the 244 responses replied synthetic marijuana. 2 students marked Ecstasy and 1 stated cough medicine.

In question 9, students were requested to answer if they had ever smoked K2. 238 students stated no, while 4 students answered yes. For reasons why, 2 people responded wanted to, while the other two stated peer pressure. Ages of first use included two students at 23 years and the other two at 20 years. Two students purchased K2 via the tobacco store, one at the convenience store and another student answered other. Nobody checked the online option. In regards to K2 costs, only one student paid \$5, while the others did not pay. One student admitted to smoking K2 daily, while the other three stated they only tried it once.

Responses concerning "Do you know anyone who has ever smoked K2" indicated that 48% said no, while 50% stated yes and 2% did not respond. Signs and symptoms shown were broken down in Table 1.

Table 1

Friends who Smoked K2 Signs and Symptom

Signs/Symptoma	Number Responded	Percentage
Bloodshot eyes	4	6%
Calm	2	3%
Chill	4	6%
Crazy	2	3%
Dizzy	4	6%
Hallucinations	4	6%
Happy	2	3%
High	4	6%
Hungry	10	16%
Immobile	2	3%
Impaired	4	6%
Lazy	2	3%
None	2	3%
Numb	2	3%
Slow/Lethargic/Fatigued	14	22%
Want more	2	3%
Total	64	100%

Recommendations for Future Studies

The following questions are proposed as further investigation which could be of value for the enhancement of drug education programs in the Texas community:

1. How effective is a drug abuse program for students?
2. Would data on K2 in colleges in other states be similar to Texas?
3. A replication of this study on a national or regional basis.
4. Would a replication of this study in 2022 reveal significant changes?
5. What will be the effect of making K2 illegal in Texas?

References

- Blake, S. (2010, June 15). *K2 spice as herbal incense fake weed marijuana substitutes*. Retrieved from <http://substanceabuse.suite101.com/article.cfm/k2-spice-and-herbal-incense-fake-weed-are-marijuana-substitutes>
- Blake, U. (2010, March 9). Herbal mixtures offer legal high: Synthetic marijuana's use on the rise. *Suite 101*. Retrieved from <http://suite101.com/article/herbal-mixtures-offer-legal-high-a211058>
- Bryner, J. (2010, March 3). *Fake weed, real drug: K2 causing hallucinations in teens*. Retrieved from <http://www.livescience.com/health/fake-marijuana-k2-hallucinations-100303.html>
- DeNoon, D. (2010, March 5). *FAQ: K2, spice gold, and herbal 'incense': Legal herbal products laced with designer drugs: Not your father's marijuana*. Retrieved from <http://www.webmd.com/mental-health/news/k2-spice-gold-herbal-incense-faq>
- Fake weed "K2" can cause hallucinations*. (2010, March 4). Retrieved from <http://www.cbsnews.com/stories/2010/03/04/health/main6266449.shtml>
- Fay, C. (2010, March 3). *'K2' poses dangers and should be illegal*. Retrieved from <http://www.cnn.com/2010/OPINION/03/02/fay.ban.k2/index.html>
- Killian, C. (2010, May 28). *Concerns grow over misuse of 'K2' -- herb that gives marijuana-like high*. Retrieved from http://www.mlive.com/news/kalamazoo/index.ssf/2010/05/concerns_grow_over_herbs_misus.html
- King, M. (2010, March 2). Teenagers smoking K2 have authorities incensed: Kids who smoke incense have easy access to legal drug. *Suite 101*. Retrieved from <http://drug-abuse.suite101.com/article.cfm/teenagers-smoking-k2-have-authorities-incensed>
- Lukachick, J. (2010, March 21). *Lawmakers hope to snuff out fake pot*. Retrieved from <http://www.timesfreepress.com/news/2010/mar/21/lawmakers-hope-to-snuff-out-fake-pot/>
- Lystra, T. (2010, June 28). *Legal, synthetic 'spice' emerges as latest challenge for anti-drug groups*. Retrieved from http://tdn.com/news/local/article_82cc258c-8313-11df-8b9b-001cc4c03286.html
- Phillips, N. (2009, November 23). Popularity of 'fake weed' growing. *The Post and Courier*. Retrieved from <http://www.postandcourier.com/article/20091123/PC1602/311239934>
- Sayers, B. (2009, November 11). Drug remains legal despite concerns. *The University Daily Kansan*. Retrieved from <http://kansan.com/archives/2009/11/11/drug-remains-legal-despite-concerns/>
- Tennies, D.A. (2012). Not your mother's drugs: The new designer drugs. *Slide Share*. Retrieved from <http://www.slideshare.net/kratomeffects/the-new-designer-drugs>
- Toxicologist warning to parents: Look for signs of K2—'fake marijuana.'* (2010). Retrieved from <http://www.sciencedaily.com/releases/2010/03/100303092405.htm>
- What is K2? (2010, March). *Journal of Occupational Medicine and Toxicology*. Retrieved from <http://k2herbal.wordpress.com/what-is-k2/>