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## Effectiveness of the synthetic cannabinoids seminar

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### ABSTRACT

**Objectives:** Synthetic cannabinoid or “Bonzai” use is a public health issue as its use has increased in Turkey as well as all over the world. The aim of this study is to evaluate the effectiveness of the “Synthetic Cannabinoids Seminar” that was provided to physicians who work in emergency services, using multiple choice questionnaires before and after the seminar as a tool for evaluation.

**Material and method:** Synthetic cannabinoids seminars were provided to physicians who work in emergency services in two different cities, with the participation of 20 physicians in each scheduled seminar. The seminars were instructed by emergency medicine specialists and psychiatrists who were certified as an instructor by the Turkish Ministry of Health, after receiving an instructor course in synthetic cannabinoids. In order to measure basal knowledge levels of the participants, a pretest was performed for all participants before the seminar. After the seminar, a posttest was performed using the same questions in the pretest. The number of correct answers in both tests was then compared.

**Results:** In total, 85 individuals attended the seminars; 29 individuals from Dumlupınar University Eviya Çelebi Training and Research Hospital constituted first group, and 56 individuals from Denizli State Hospital constituted second group. In both groups, the ratios of correct answers in the posttest were determined to be higher when compared to the pretest.

**Conclusion:** The seminars on synthetic cannabinoids are useful and necessary for physicians.

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## 1. Introduction

For centuries, cannabinoids have been used as pleasure-inducing substances. As there are a growing number of worrisome reports taking place in the media, Bonzai use threatens public health at an alarming rate. Bonzai is a synthetic drug created via the addition of chemical compounds to various dried and decomposed plants. Synthetic cannabinoids (SCs) are tetrahydrocarbon-like naphtholindoles. The SC JWH-018 molecule, which is also called Bonzai, was developed at the Clemson University Organic Chemistry Laboratory in 1995, by Professor John W. Huffman.<sup>1</sup>

In Turkey, JWH-018 molecule is sold in packages that have “bonzai” written on them, hence the given name. In Europe, it is known as “spice”, and in America it is known as “K2”. Owing to the recently increased production of SCs and the lower cost of their

distribution, SC use has increased. SCs known as “Bonzai, Jamaican, Spice, Spicgold, Spicesilver, Yutacan Fire, K2” in the market can easily be obtained.<sup>2,3</sup> Especially recently, SC use has increased among adolescents and young adults.<sup>4</sup> One study from the US in 2011 reported that 11% of high school students used marijuana (cannabis) or SCs during the last 12 months.<sup>5</sup> Some of the reasons why SCs are so popular are that they are known to have cannabis-like properties, they can be obtained easily, they are inexpensive and they can not be detected in routine drug screening tests.<sup>3</sup> In 2009, European countries started to ban and control the use of SCs, with Austria and Germany being the first.<sup>6,7</sup> In Turkey, it had been used extensively until the Council of Ministers decided on 7 January 2011 to add it to the list of substances that are subject to the Law on Control of Narcotic Drugs, with issue number 2011/1310.<sup>8</sup>

In December 2014, a total of 165 physicians, consisting of emergency medicine specialists and psychiatrists, received an instructor's course on SCs that was given by the Turkish Ministry of Health. This instructor course was given by Turkey's Public Hospitals Institution Health Facilities Emergency Health Services Head of Department, academic personnel in Emergency Medicine and

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**Table 1**  
Test questions.

1	What is the chemical code of “Bonzai”, which is a synthetic cannabinoid?
2	Which is not required to call a person an addict?
3	Which is not an appropriate approach to a patient who uses narcotic drugs?
4	Which of the following findings is less likely in cannabinoid use?
5	Which of the following parameters has less importance in examination of synthetic cannabinoid use?
6	Which is not regarded as normal during observation of patient using synthetic cannabinoid?
7	Which would be your first option in an agitated patient due to synthetic cannabinoid use?
8	Which would be your first option in a patient with tachycardia due to synthetic cannabinoid use?
9	Which is not expected in a patient with prolonged agitation who has been physically restricted?
10	For which patients who use synthetic cannabinoid, admission to hospital is generally not necessary?
11	Which is not a purpose of supervised release?
12	Do you feel competent in treating a patient exposed to synthetic cannabinoid, considering your present knowledge?

Psychiatry who were experienced in toxicology, and academic personnel experienced in Forensic Medicine.

The course included topics on the history of SCs, their chemical actions, areas of use, and treatment and forensic aspects after exposure. In order to achieve a standard for instructors throughout the country, the training material that they are supposed to use during the seminars was given to them. After this course, the attendants were titled as a “Synthetic Cannabinoid Instructor”, and seminars were scheduled throughout the country. On the scheduled day, these seminars were provided to general practitioners and emergency medicine specialists working in emergency services in all cities of Turkey.

The aim of our study is to examine the effectiveness of the seminars given by Ministry of Health on knowledge levels of the physicians working in emergency services, and to evaluate physicians' knowledge levels after attending the seminars.

## 2. Material and method

As an exclusion criteria, we determined to exclude the participants who were reluctant but non of the physicians refused to participate the study.

In Dumlupınar University Evliya Çelebi Training and Research Hospital and in Denizli State Hospital, the seminars were led by two instructors (an emergency medicine specialist and a psychiatrist). In order to measure basal knowledge levels of attendants on the seminar topic, a “pretest” was performed that was composed of 12 questions. Participants were advised not to interact during this pretest. During the seminars which lasted for 60 minutes, the instructor emergency medicine specialists lectured using 48 slides. The same test was repeated at the end of the seminar, again while preventing interaction between participants.

In order to determine the effectiveness of the seminars, a test consisting of 12 questions was performed as a pretest and posttest to the attending physicians in two different cities (Table 1). Tests

consisted of multiple-choice questions, and were prepared based on the training materials provided by the Ministry of Health.

Time allowed for the pretest and posttest was 20 minutes. Physicians in the seminars were prevented from interacting with each other while answering the questions. Demographical data such as age and sex of the participant physicians was obtained during the pretest. Before the study, all attending physicians were informed that their scores would not be shared with other participants, their names were not required, and that the purpose of the test was to determine the effectiveness of the seminar.

The software package SPSS for Windows version 16.0 was used for statistical analysis. The data are presented as mean, standard deviation (SD) and percentiles. Percentiles were rounded to the closest whole number.

## 3. Results

The study group was comprised of 85 physicians. There were 29 physicians from Dumlupınar University Evliya Çelebi Training and Research Hospital and 56 physicians from Denizli State Hospital. Mean age of the whole group was  $34.9 \pm 8.7$  years (min. 25, max. 63 years old), with 58 (68.2%) male and 27 (31.8%) female.

The ratios of correct answers at pretest and posttest are presented in Table 2.

In both pretest and posttest, participants were asked whether they felt competent in treating a patient exposed to SC, considering their present knowledge, in the 12th question. In the pretest, this question was answered as “yes” by 11 (12.9%) participants, whereas this number increased up to 79 (92.9%) participants after the seminar (Table 3).

## 4. Discussion

In this study, physicians working in emergency services were tested for their knowledge before and after attending a seminar on SCs, and it was observed that the seminars were successful overall.

**Table 2**  
Ratio of correct answers at pretest and posttest in both groups.

	Pretest	Posttest
Q1: What is the chemical code of “Bonzai”, which is a synthetic cannabinoid?	67.9%	98.8%
Q2: Which is not required to call a person an addict?	38.8%	81.2%
Q3: Which is not an appropriate approach to a patient who uses narcotic drugs?	77.6%	92.9%
Q4: Which of the following findings is less likely in cannabinoid use?	28.2%	50.6%
Q5: Which of the following parameters has less importance in examination of synthetic cannabinoid use?	70.2%	90.6%
Q6: Which is not regarded as normal during observation of patient using synthetic cannabinoid?	53.0%	89.4%
Q7: Which would be your first option in an agitated patient due to synthetic cannabinoid use?	31.8%	90.6%
Q8: Which would be your first option in a patient with tachycardia due to synthetic cannabinoid use?	34.1%	95.3%
Q9: Which is not expected in a patient with prolonged agitation who has been physically restricted?	55.3%	89.4%
Q10: For which patients who use synthetic cannabinoid, admission to hospital is generally not necessary?	97.6%	98.8%
Q11: Which is not a purpose of supervised release?	57.1%	71.4%

**Table 3**

Ratio of the physicians who answered “yes” to the question “Do you feel competent in treating a patient exposed to synthetic cannabinoid, considering your present knowledge?”

	Pretest	Posttest
Do you feel competent in treating a patient exposed to synthetic cannabinoid, considering your present knowledge?”	12.9%	92.9%

According to reports from The American Association of Poison Control Centers (AAPCC), the number of exposures to SCs in 2009 was 53, whereas in 2011 this number was 13,000.<sup>9</sup> In their study, Wood et al determined the number of SC exposures was 14 in 2009, 2821 in 2010 and 6255 in 2011, and they stated that the number in 2012 was even greater than in 2011.<sup>10</sup> As SC use grows, related admissions to emergency departments also increase. SC use is especially increasing among adolescents and young adults.<sup>4</sup>

Vandrey et al aimed to study out the characteristic properties of SC abused patients in an internet-based study with the participation of 168 people. Respondents were primarily male, Caucasian and  $\geq 12$  years of education. Use of other psychoactive drugs was common, though 21% identified Spice products as their preferred drug.<sup>11</sup>

In a study, Kuçuk et al examined demographical data of 112 patients who presented directly to emergency departments during a six month period between 01.02.2014 and 31.07.2014 due to use of SCs called Bonzai or Jamaica; they reported that 111 patients were male and only one patient was female. Mean age of the patients was  $23.32 \pm 6.14$  years. Sixty-one patients (55.46%) were discharged after being evaluated in the emergency department, 27 patients (24.10%) were treated in the intensive care unit, 15 patients (13.39%) left the emergency department after refusing treatment or without notice, and 9 patients (8.03%) were admitted to the internal medicine ward.<sup>12</sup> Discharge rates from emergency departments are low, and admission rates to intensive care units are high; this could be due to physicians' insufficient knowledge on SCs. Their knowledge levels can be increased with training.

Aksel et al reported that 190 of the 197 patients over the age of 18, who presented to the emergency department of training and research hospital during two years' time were male, with four patients being hospitalized and two patients dying. Both patients who died were male, and they were intubated on presentation due to low GCS. Of the remaining patients, 52 were discharged of their own will, and 141 patients were discharged after inspection for 6–12 h. Mean age of the presenting patients was 22 (19–27) years. Mean systolic blood pressure was 120 (110–126) mmHg, mean diastolic blood pressure was 70 (62–80) mmHg, and mean pulse rate was 89 (78–105) bpm.<sup>13</sup>

In 2013, Lank et al prepared a self-administered internet-based survey, to which 73 emergency physicians attended. 72% of the attendees reported that they are informed via non-medical sources about SCs, 17% of them were unaware of these drugs' marijuana-like effects, and 25% of them did not know SCs are synthetic drugs. Nearly 80% of the physicians do not feel qualified enough in treating a patient intoxicated with SCs. According to the results of this study, emergency physicians are very unfamiliar with SCs, thus most of them need additional training.<sup>14</sup>

Urazel et al in 2015, applied a questionnaire to 100 physicians (42% research assistants, 29% expert physicians and 29% practitioners) who work in emergency department, to assess the knowledge of the physicians on SCs. Questions were about general information on these drugs. As a result of this research it was reported that it is essential to improve the physicians' knowledge about these substances, as their use is rapidly increasing day by day.<sup>15</sup>

In our study, we observed that the Turkish Ministry of Health's seminars on SCs that were provided to physicians working in emergency services in two different cities were effective.

## 5. Limitations

This study is limited by its small sample size that may not represent all the physicians in Turkey, as well as in the world. Also, the seminars were provided by different instructors that may lead unstandardized education despite the standard educational material.

## 6. Conclusion

There's an increasing use of SCs in Turkey and all over the world.<sup>1</sup> Physicians often fail to follow the development rate of these drugs, their effects, chemical structures and treatment. Emergency physicians should have a continuous education on these substances.

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