



Short Communication

A new method of cannabis ingestion: The dangers of dabs?

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ABSTRACT

A new method for administering cannabinoids, called butane hash oil (“dabs”), is gaining popularity among marijuana users. Despite press reports that suggest that “dabbing” is riskier than smoking flower cannabis, no data address whether dabs users experience more problems from use than those who prefer flower cannabis.

Objective: The present study aimed to gather preliminary information on dabs users and test whether dabs use is associated with more problems than using flower cannabis.

Method: Participants ($n = 357$) reported on their history of cannabis use, their experience with hash oil and the process of “dabbing,” reasons for choosing “dabs” over other methods, and any problems related to both flower cannabis and butane hash oil.

Results: Analyses revealed that using “dabs” created no more problems or accidents than using flower cannabis. Participants did report that “dabs” led to higher tolerance and withdrawal (as defined by the participants), suggesting that the practice might be more likely to lead to symptoms of addiction or dependence.

Conclusions: The use of butane hash oil has spread outside of the medical marijuana community, and users view it as significantly more dangerous than other forms of cannabis use.

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1. Introduction

Cannabis is the most commonly used controlled substance in the United States (SAMHSA, 2012). Over 107 million Americans older than 12 years report ever having used cannabis, and an estimated 18.1 million report using it in the past month (SAMHSA, 2012). A significant proportion of those who use cannabis regularly report that their primary motive for use is for medicinal purposes (Bonn-Miller, Zvolensky, & Bernstein, 2007). Recent legislative changes pertaining to the legal use of medicinal marijuana have made medical marijuana dispensaries increasingly prevalent (Reuteman, 2010). Dispensaries offer increased options for methods of administration of cannabis. Mechanisms such as vaporizers, edibles, and liquid tinctures have become popular alternatives to the traditionally smoked flower cannabis (Schnelle, Grotenhermen, Reif, & Gorter, 1999). One alternative method of cannabis use, known as “dabbing,” is increasing in popularity among medicinal users and might carry unique risks.

1.1. What is dabbing?

Dab(s) is the colloquial name for concentrated butane hash oil (or BHO). It resembles a hard, wax-like concentrate and is created through butane extraction of THC from flower cannabis. The result is a substance with a higher THC concentration compared to traditional forms of

cannabis. Informal reports suggest that butane hash oil can reach THC concentrations upwards of 70% to 90%, whereas flower concentrations traditionally range between 3% and 6%. However, more conservative estimates suggest that the concentrations of dabs contain doses closer to 20% to 25% (Mehmedic et al., 2010), a THC content that is still significantly higher than those found in traditional flower forms. The term “dabbing” refers specifically to the common method for ingestion of butane hash oil, where a “dab” of the dense oil is placed on the end of a glass or titanium rod that has been heated, typically with a blowtorch. The concentrate is then vaporized very quickly, allowing the user to inhale the vapors and swiftly feel its effects.

1.2. Potential for harm

Little is known about the potential risks associated with dab use compared to those associated with traditional flower cannabis use. Nevertheless, the process of inhalation (e.g., lighting a titanium rod/nail with a blowtorch, producing fire near butane if inhaled in the same area as butane extraction) seemingly carries inherent dangers. Moreover, the increased concentration of Δ^9 -THC, one of the primary psychoactive compounds in cannabis, might also increase risk for problems among users. Likewise, the process of dabbing might lead to more rapid administration, thereby increasing risks associated with dependence. The increased THC concentration and novel means of administration might be associated with problems such as increased physiological tolerance and potential withdrawal.

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Literature on the use of dabs is lacking. At present, no articles appearing in academic journals mention dabs or butane hash oil use, suggesting that many practitioners and researchers are unfamiliar with the term. Attention to dabbing is just emerging in the popular press. In an interview conducted earlier this year with the leading popular marijuana magazine *High Times*, the senior editor stated that “[although BHO isn’t new] ... it was only done by a few people and it was very underground. Even at *High Times* we didn’t really talk about it or cover it because it was so rare” (as quoted in Hallett, 2013, February 20). Five months later, “Dabs!” was run as the cover story in the July 2013 issue of the magazine. This shift in coverage might suggest that use of dabs is on the rise. Nonetheless, while awareness of butane hash oil is increasing in the popular media, there is no known scientific work examining the prevalence or likelihood of problems associated with its use.

1.3. Aims

The aim of the present study was to collect preliminary information on the use of “dabs” within the United States. We specifically aimed to assess why some users prefer “dab(s)” to other forms of cannabis, whether those who have used butane hash oil perceive dab use as more dangerous than smoking or vaporizing traditional flower cannabis, and whether dab use is associated with more problems than flower cannabis use. Based on the potential for accidents with increased exposure to a blowtorch, as well as the rapid intake of higher amounts of psychoactive cannabinoids, we hypothesized that participants would report experiencing more cannabis-related negative consequences from their dab use than from their flower cannabis use.

2. Method

2.1. Procedure

Following institutional review board approval, a survey administered through the website www.surveymonkey.com was created that consisted of the measures specified below. Participants were directed via an Internet link to the survey and asked to complete each measure.

2.2. Participants

Participants were respondents to an advertisement posted on www.craigslist.org calling for volunteers for a marijuana-related survey on dabs use. Advertisements were posted in twelve major cities across the United States. The advertisement specifically recruited participants with a history of dabs use. The recruitment flyer did not provide an explicit explanation of what “dabs” use referred to but included term synonyms (e.g., hash oil, honey oil, BHO). Participants were advised that they would be entered into a raffle for a cash prize in exchange for completing the survey. There were approximately 600 respondents who followed the link in the advertisement to the survey.

2.2.1. Selection of the current sample

Participants were excluded if they did not report having used hash oil (aka dabs), if they were younger than 18 years, or if they did not report their age.

2.2.2. Demographics of the current sample

The 357 people who qualified included 211 men (59.1%), 145 women (40.6%), and 1 who did not report gender (.3%). Ages ranged from 18 to 71 years ($M = 28.74$, $SD = 10.12$). Education ranged from some high school to advanced degrees. The majority of the respondents were Caucasian (61.6%). The sample also included Latinos (14.6%), Native Americans (1.7%), African Americans (5.3%), Asians (5.3%), those who endorsed multiple ethnicities (7.6%), and those who preferred not to disclose their ethnicity (3.9%).

Participants were primarily heavy or daily cannabis users, who reported using cannabis an average of 5.71 days per week ($SD = 2.01$, range = 0–7). Participants also reported using an average of 8.38 g of cannabis per week ($SD = 9.28$, range = 0–80). Regarding their dab use, 12.6% of participants reported that they did dabs “daily,” 15.6% “more than once a week but less than daily,” 10.1% “about once a week,” 13.6% “more than once a month but less than once per week,” 13.1% “about once per month,” and 35.2% reported using dabs “less than once per month.” Participants were asked whether their use of cannabis serves a primarily medicinal purpose or not. One hundred and fifty one respondents reported that they were primarily medicinal users (42.3%), while 206 respondents reported that they were primarily recreational users (57.7%).

2.3. Measures

The current study included questionnaires that assessed whether participants preferred dabs to other forms of cannabis, participants’ reasons for preferring dabs to flower cannabis, whether they had ever used vaporizers or other mechanisms associated with reduced risk, whether they prefer dabs to vaporized flower cannabis, and if so, what their reasons were for preferring dabs to vaporizers. In addition, measures included questions on perceived safety and experience of negative consequences and accidents associated with use.

2.3.1. Preference for dabs use

Participants were given a list of reasons why they might prefer dabs to flower cannabis and asked to endorse all items that were true for them (Yes or No). An open-ended “other” option was also included for participants to write in any additional preference reasons.

2.3.2. Perceived safety

Participants were asked to report how safe they felt both flower cannabis and dabs were, using a 5-point Likert scale ranging from “not at all safe” to “very safe.”

2.3.3. Negative consequences

Participants were asked to report on their experience of negative consequences from both flower cannabis and dabs by answering the question, “Have you ever experienced any negative side effects from using _____?” (Yes or No). The question was phrased to assess for both flower cannabis and dabs.

2.3.4. Accidents

Problems such as burns and accidental fires were assessed by asking participants “Have you ever had an accident from the process of using _____ (for example, burns, accidental fires, etc.)?” (Yes or No). The question was phrased to assess for both flower cannabis and dabs.

2.3.5. Tolerance and withdrawal

Two single items were used to assess for increases in tolerance and increases in the experience of withdrawal resulting from dab use. Participants were asked to respond to the questions, “Do you find that dabs increase your tolerance so that you need more dabs or more flower cannabis than you used to?” and “Do you find that dabs increase your withdrawal symptoms when you are not doing dabs or smoking flower cannabis?” No other definitions of these terms appeared; participants interpreted “tolerance” and “withdrawal” on their own. Participants responded to these questions using a 4-point Likert scale corresponding to the following responses: “not at all,” “a little bit,” “somewhat,” and “definitely.”

3. Results

Data were analyzed using SPSS 19 statistical software, using descriptive analysis of frequencies, two *t*-tests, and *z* and McNemar's tests for proportional differences.

First, we were interested in seeing why users prefer dabs to other forms of cannabis. Rates of endorsement for reasons that participants prefer dabs to flower cannabis appear in Fig. 1.

The most commonly endorsed reasons for preferring dabs were that it requires fewer hits to achieve the desired effects (139/357), the effects are stronger (126/357), and that the "high" is a different effect (121/357). Other qualitative responses given for preferring dabs that were not directly assessed include the following: dabs are faster, more effective for pain relief, give a "cleaner" high, no ash by-products, better quality, and reasons associated with novelty and experimentation.

We were also interested in whether dabs users had previously tried vaporizers. Vaporizers are an alternative ingestion method that are less harmful than pipes, bongs, and joints for inhalation of cannabis and are popular among medicinal users (Earleywine & Barnwell, 2007). We were interested in whether dabs users had tried vaporizers, and if so, whether they preferred dabs to vaporizers. Two-hundred and nine dabs users (58%) reported that they had used a vaporizer before. Of those, 67 preferred the use of dabs to vaporizers (32%). Among medicinal users, 98/151 (65%) reported having used a vaporizer before with 36/98 preferring dabs (37%). Non-medicinal/recreational cannabis users also reported experience with vaporizers, with 111/206 (54%) of non-medicinal/recreational cannabis users reporting that they had used a vaporizer before and 31/111 (28%) preferred dabs to vaporizers. The difference between the proportion of medicinal users and the proportion of recreational users who had used vaporizers before that preferred dabs to vaporizers failed to reach significance ($z = 1.4, p = .16$). There was no significant evidence to suggest that medicinal users and recreational users differed in their preference for dabs versus vaporizers.

Our second aim was to assess whether dabs users perceived hash oil as safer or more dangerous than using flower cannabis. A paired sample *t*-test was significant ($t = 18.05, p < .001$), suggesting that dabs users perceive flower cannabis as safer to use overall ($M = 3.33, SD = 1.10$) than hash oil ($M = 1.95, SD = 1.33$).

Finally, we were interested in seeing whether dabs users reported on average more problems because of their dabs use than problems related to their use of flower cannabis. Two McNemar's tests for dependent proportions were implemented to test whether a higher proportion of users reported experiencing negative consequences and accidents due to their dabs use compared to the proportion that experienced

negative consequences and accidents directly related to their flower cannabis use. Both tests failed to reach significance ($\chi^2_{\text{NegativeConsequences}}(1, N = 357) = 19.89, p = .59$; $\chi^2_{\text{Accidents}}(1, 357) = 15.87, p = .11$). Power analysis suggested that our computations were adequately powered to find small to moderate effects if present (Faul, Erdfelder, Buchner, & Lang, 2009).

We also asked all respondents whether they had experienced an increase in tolerance and withdrawal to cannabis after using dabs. Results from two one sample *t*-tests suggest that dabs users report on average an increase in both withdrawal ($t = 6.18, p < .001$) and tolerance ($t = 12.22, p < .001$) compared to flower cannabis. The average increase in withdrawal comparing dabs to flower was ($M = .22 (SD = .53)$) .42 standard deviations on a 4-point scale. Likewise, the effect size for the average increase in tolerance was large ($M = .68, SD = .83$), $d = .82$. These results suggest that participants viewed dabs as more likely to create these symptoms of dependence or an addiction syndrome.

4. Discussion

Our primary objective for the current study was to gather preliminary data on the characteristics of those who use butane hash oil (dabs). We were interested in assessing why users choose and prefer hash oil, whether or not those who use dabs report experiencing problems above those experienced from flower cannabis, and whether they perceive risk involved in the process of doing dabs. Among those who prefer dabs to other forms of cannabis, the most commonly cited reasons for their preference were that fewer "hits" were necessary, that the effects were stronger, and that the effects lasted longer. Most of our sample cited reasons for preferring dabs related to needing less of the drug to achieve a more potent effect (e.g., effects last longer and stronger), suggesting that preference for dabs might be due to its potential medical efficacy. Moreover, the rising interest in dabs seems to correspond with its recent availability in medical marijuana dispensaries, suggesting that recent increases in dabs use might be attributable to its use among medicinal users. Nevertheless, while a substantial proportion of our participants reported that their reasons for using hash oil were for medicinal purposes, findings suggest that hash oil is being used for reasons other than therapeutic effects. More than half of the participants who reported using dabs did not identify as "medicinal users." Moreover, the majority of medicinal users in our sample reported that they preferred the use of vaporizers for flower cannabis to the use of dabs.

Owing to the nature of the inhalation process, dabbing seems to have the potential to carry more risk to users than other methods of

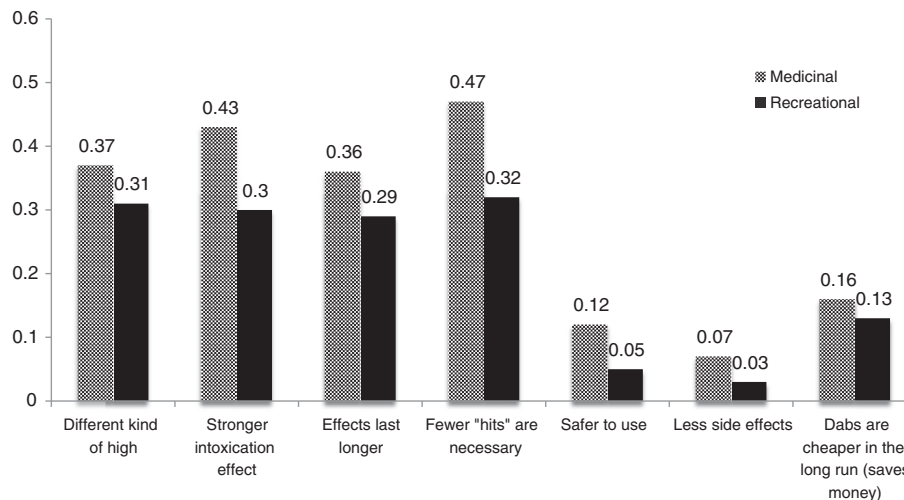


Fig. 1. Endorsement rates of reasons that participants prefer dabs to flower cannabis by user type.

ingesting or inhaling flower cannabis. However, results did not indicate that those who prefer dabs experience more problems or accidents due to their cannabis use than those who prefer flower cannabis. Nevertheless, flower cannabis was perceived as safer overall to use than hash oil. Users suggested that dabs led to higher rates of both tolerance and withdrawal, suggesting that risk for dependence might be heightened with this mode of administration. The current study's finding that dabs use is associated with an increase in tolerance and withdrawal compared to traditionally inhaled flower cannabis is consistent with the premise that routes of administration that increase rate of absorption of the same psychoactive components can lead to more rapid rates of dependency (e.g., intranasal use of powder cocaine versus smoked use of "crack" cocaine).

There are several limitations that should be noted due to the preliminary nature of the current study. We chose to use single items to assess for self-reported tolerance and withdrawal rather than more sophisticated and validated but longer measures (e.g., Budney, Novy, & Hughes, 1999; Lee, Neighbors, Hendershot, & Grossbard, 2009). We chose brevity in an effort to limit respondent burden and increase participation. Because no scientific literature exists on this new route of administration, we wanted to disseminate initial findings to inspire future work as quickly and efficiently as feasible. Likewise, a single item was also used to categorize users as either medicinal or not. "Medicinal user," however, could carry different connotations for different individuals. We do not know whether those identifying as primarily medicinal users chose this categorization based on medicinal card holding status, doctor recommendation, or because they choose to use marijuana for the amelioration of symptoms that cannabis has been empirically supported to treat or not. The category "medicinal user" likely does not define a perfectly homogenous group. Finally, the current study was limited by its correlational and self-report design. Nevertheless, we did not see this as a major problem, as the study was designed to be entirely preliminary. Our primary aim was to see whether there was any scientific basis to popular assertions of potential increased risks related to dabs use and whether future work in the area might be warranted.

The current study is the first of its kind to investigate the use of butane hash oil (dabs) among a national sample of cannabis users who report having tried dabs. Future work is needed to assess whether self-reports of problems correspond with actual negative consequences related to the use of dabs. Overall, results suggest that the use of butane hash oil has spread outside of the medical marijuana community and is

perceived among users as significantly more dangerous than other forms of cannabis use.

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The authors received no external funding for the current study.

Contributors

Author Mitch Earleywine proposed the initial idea for the study. Mallory Loflin and Mitch Earleywine both mutually designed the study and wrote the protocol. Author Mallory Loflin conducted literature searches, statistical analysis, and wrote the first draft of the manuscript. Both authors contributed to and have approved the final draft of the manuscript.

Conflict of interest

The authors declare that they have no financial competing interests to report.

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