

Assessment of Online Availability of Diamond Shruumz Before and After FDA Recall Initiation: Qualitative Assessment and Simulated Test Purchasing

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Assessment of Online Availability of Diamond Shroomz Before and After FDA Recall Initiation: Qualitative Assessment and Simulated Test Purchasing

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Abstract

Background: Recent reports of hospitalization associated with Diamond Shroomz products, a mushroom-containing product, has led to a manufacturer's recall that restricts the sale, distribution, and accessibility of this new and emerging psychoactive product. This study sought to assess the continuing online availability of this product in a diverse e-commerce landscape.

Objective: Identify and characterize online availability of mushroom-containing edible product pre and post recall initiation.

Methods: Retrospective online market surveillance of Diamond Shroomz products using structured and automated search queries were employed to identify online product marketing and availability. Online surveillance included multiple social media platforms, cannabis e-commerce websites, and search engine queries between June 22 – June 27, 2024, immediately preceding the manufacturer-initiated recall. Post-recall simulated purchases were then conducted on July 12, 2024 on platforms, websites and domains identified as continuing to actively market and sell through online product listings.

Results: Prior to product recall, a total of 4,117 product listings across 1,600 (38.86%) social media posts and user-generated comments, 11 (0.27%) shops across cannabis e-commerce websites, and 2,509 (60.94%) hyperlinks from internet search queries were generated for further content analysis. Review of online sources revealed 49 social media posts, 8 e-commerce shops and 67 domains that were identified as marketing and selling products pre-recall. Post-recall, we identified 45 (67.16%) remaining domains that continued to market the product from these sources. Simulated purchases revealed that 15 (33.33%) domains successfully transacted test purchases and 30 (66.66%) transactions failed because of account verification or payment failure.

Conclusions: The Diamond Shroomz recall represents the ongoing challenge of unknown consumer harm associated with new and emerging substances, especially as these products appeal to younger audiences with a variety of edible flavored products. While a recall has been initiated and product was to be made unavailable, our study found that online vendors continue to market and sell Diamond Shroomz products, indicating that implementation and enforcement are ongoing challenges to effectuate a recall in a diverse e-commerce landscape of new and novel psychoactive substances. Clinical Trial: Not applicable

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CONTENT TYPE: Short Report**TITLE: Assessment of Online Availability of Diamond Shrooms Before and After FDA Recall Initiation: Qualitative Assessment and Simulated Test Purchasing**

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ABSTRACT:

Introduction: Recent reports of hospitalization associated with Diamond Shroomz products, a mushroom-containing product, has led to a manufacturer's recall that restricts the sale, distribution, and accessibility of this new and emerging psychoactive product. This study sought to assess the continuing online availability of this product in a diverse e-commerce landscape.

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Conclusion: The Diamond Shroomz recall represents the ongoing challenge of unknown consumer harm associated with new and emerging substances, especially as these products appeal to younger audiences with a variety of edible flavored products. While a recall has been initiated and product was to be made unavailable, our study found that online vendors continue to market and sell Diamond Shroomz products, indicating that implementation and enforcement are ongoing challenges to effectuate a recall in a diverse e-commerce landscape of new and novel psychoactive substances.

Introduction

As of July 15, 2024, the U.S. Food and Drug Administration (FDA) and U.S. Centers for Disease Control and Prevention (CDC) have reported 69 illnesses in 28 states, including 36 hospitalizations and one possible death, potentially associated with the consumption of the consumer edible brand, Diamond Shroomz.[1,2] Diamond Shroomz products, which include a diverse variety of flavored infused cones, chocolate bars, and gummies, contain muscimol, a non-federally scheduled chemical derived from Amanita mushrooms (*A. muscaria* is currently legal); however, batches of the product have been tested by the FDA and found to contain a designer drug synthetic analog (4-acetoxy-DMT, also known as *O*-acetylpsilocin or psilacetin) that can be equivalent to a Schedule 1 controlled substance under the Federal Analogue Act when sold for human consumption.[2–4] Other reports have characterized these products as being marketed as “nootropics” (substances taken to enhance cognitive function) and found that some contain unlabeled and undisclosed psilocybin and psilocin.[5]

Diamond Shroomz products were sold across a variety of U.S. retailers including tobacco shops, cannabis stores, and hemp-derived retailers and could be the cause for a number of adverse event symptoms now being reported to state poison control centers including seizures, loss of consciousness, nausea and vomiting, and hyper/hypotension.[6] Though the manufacturer (Prophet Premium Blends, LLC) initiated a recall of these products on June 27, 2024, and agreed to cease production and distribution of the Diamond Shroomz product line, ongoing online availability and retailer compliance with recall requirements has not been adequately studied.[6,7] Hence, in this short paper we sought to examine the continued online availability of these products using a protocol involving multiplatform online market surveillance and content analysis and targeted simulated test purchases.

Methods

We conducted a qualitative retrospective online market surveillance study to assess whether Diamond Shroomz products continue to be marketed and made available for purchase online (see **Figure 1** for summary of study methods). This included conducting structured and automated search queries on social media platforms (Instagram, Reddit, Telegram, Tumblr, Twitter/X, and YouTube), cannabis product listings e-commerce platforms (Dutchie, Leafly and Weedmaps), and website hyperlinks generated from popular search engine results (Bing, DuckDuckGo, and Google) conducted from June 22 – June 27, 2024, immediately preceding the manufacturer-initiated recall (see **eSupplement**).

Qualitative review of social media posts, e-commerce product listings, and websites generated from search queries was conducted to identify active direct-to-consumer sale of any of the Diamond Shroomz products that were subject to recall. Where possible, we also attempted to assess if a seller was licensed by their respective state licensure board (e.g., state cannabis control board). For websites actively advertising the sale of Diamond Shroomz products, analysis also included assessment of any age verification processes, web forensics for Internet sites using the Internet Corporation for Assigned Names and Numbers (ICANN) WHOIS look-up tool; simulated test purchases in the period following the announcement of the recall were conducted to identify websites continuing to sell product.[8]

Simulated test purchases involved selecting a Diamond Shroomz product from an online seller that utilized traditional e-commerce tools (e.g., hosted website, shopping cart, payment processing), placing it in an e-commerce shopping cart, proceeding through the purchase process, and simulating the purchase transaction using a credit card number generator that has been used in previous studies for e-commerce testing and straw buy purposes.[9–11] Completion or denial of the transaction was documented. Qualitative data analysis and simulated purchases were performed on July 12, 2024, two week after the manufacturer initiated the recall notice.

This study utilized publicly available data and did not involve human subjects or any personally identifiable information from individuals or online sellers.

Results

Market surveillance detected a total of 4,117 Diamond Shroomz product listings available across all parts of the Internet. Product listings potentially selling Diamond Shroomz products were found on 1,600 (38.86%) social media posts and comments, 11 (0.27%) cannabis e-commerce websites, and 2,509 (60.94%) hyperlinks from internet search queries from the period immediately preceding the initiation of the recall (see **Table 1** for summary breakdown, **Table 2** for examples of active selling posts after initiation of recall and **eSupplement Table** for simulated test purchase results).

Social media queries

Automated search queries on select social media platforms (Instagram, Reddit, Telegram, Tumblr and Twitter/X) identified 1,600 Diamond Shroomz product listings, where 96.25% (n=1540) originated from user-generated posts and 3.75% (n=60) were from user-generated comments across only two platforms (Instagram and Reddit). Direct-to-consumer advertisements with links or contact information on where users could directly purchase product made up 3.06% (n=49) of posts, of which 67.35% (n=33) originated from Instagram, 28.57% (n=14) from Twitter/X, and 4.08% (n=2) from Telegram. Simulated purchases were conducted on the social media posts where only 1 social media advertisement, detected on Twitter/X, was still actively selling Diamond Shroomz products after recall initiation.

Cannabis e-commerce product listings

Structured search queries on cannabis e-commerce product listing websites (Dutchie, Leafly, and Weedmaps) detected a total of 8 product listings (belonging to 4 unique cannabis vendors) that advertised Diamond Shroomz products. Cannabis e-commerce platform vendor breakdown of these listings included Dutchie 12.5% (n=1), Leafly 62.5% (n=5), and Weedmaps 25% (n=2). All vendor listings on Dutchie and one vendor listing from Weedmaps were linked to the same licensed cannabis retailer in Alaska. The remaining Weedmaps listing was linked to an expired licensed cannabis retailer in Oklahoma. Leafly store listings were linked to two shops where one was verified

to have an active cannabis license in Hawaii and one from Wisconsin that could not be verified due to lack of access to publicly available state licensure data. Post-recall simulated purchases identified the Alaska storefront as still actively selling Diamond Shroomz product.

Structured Internet search queries

For internet search queries, a total of 2,509 hyperlinks, comprised of 237 unique domain names, were collected where 67 (28.27%) of domains were identified as actively selling Diamond Shroomz products prior to recall. From the sellers with sufficient information to cross-reference available state cannabis licensure data, none were linked to a valid retail cannabis state license. All websites that were actively selling Diamond Shroomz went through web forensics analysis. The majority (61.19%, n=41) included registrant information located in the United States (including Arizona, Pennsylvania, and California as the top 3 states), followed by Canada and Iceland, with two websites also using domain privacy services to hide their information. Slightly over half (55.22%, n=37) of sites reviewed had any form of age verification, with those that did requiring a single, non-restricted click that a user was over the age of 18 (or 21, based on applicable laws). Post-recall, 67.16% (n=45) of re-reviewed websites continued to advertise the sale of Diamond Shroomz product. One-third (33.33%, n=15) of those websites continued to offer the sale of a product (i.e., where transaction and simulated purchase was successful) while two-thirds (66.66%, n=30) of transactions failed to process (i.e., payment not accepted, used robust account verification).

Discussion

Results from this study indicate that the time period immediately preceding the manufacturer-initiated recall (a period when the FDA, America's Poison Centers, and U.S. Centers for Disease Control and Prevention identified initial concerns about illness associated with consuming these products and provided updates to the public) had a relatively high number of advertisements available across multiple parts of the Internet. Following the recall notification, the number of online access points appears to have decreased, however, we nevertheless identified at least forty-seven

active sellers across social media, cannabis e-commerce, or website platforms. Similar to prior studies examining online availability of psilocybin [12], there were a high number of continued access points that originated from search engine results, where we found two-thirds of websites still actively advertising with one-third of those successfully completing a simulated test purchase, and some vendors actively reaching out through email seeking to complete a cancelled order we initiated.

The Diamond Shroomz product recall personifies some of the ongoing challenges of unknown consumer harm associated with new and emerging substances; in this case, novel edible mushroom-containing nootropics. This incident has a similar fact pattern to the 2019 outbreak of e-cigarette or vaping product use-associated lung injury (EVALI), which ended with a total of 2,807 hospitalized cases (68 of which were deaths) attributed to vitamin E acetate in THC-containing nicotine products.[13] In the case of Diamond Shroomz, interest in psychedelics and psilocybin therapy is growing and driving new and emerging product availability, though recently an FDA advisory committee declined to recommend the approval of MDMA-assisted psychotherapy.[14-16] Though psilocybin remains illegal, online availability of products mimicking psychedelic effects or possibly containing micro-doses of psychoactive properties, appear to be available online direct-to-consumer, despite unknown potential health risks. To capitalize on the growing interest but also slow path of potential legalization of psychedelics, manufacturers may be experimenting with undeclared and unlabeled synthetic analogues for human consumption, such as 4-AcO-DMT.[3,17] Alarming, these products also include appealing marketing of diverse edible forms (e.g., gummies, bars, cones) and flavors (e.g., chocolate, birthday cake, various fruit flavors) found with other increasingly publicly acceptable substances such as cannabis and nicotine products, which may be attractive to children and young adults.

Continued availability of these products, while in the early stages of initiation of this recall, also highlights the challenges of effectuating recalls in a diverse e-commerce landscape for a novel product that has legal ambiguity (i.e., *A. muscaria* is legal and 4-AcO-DMT is unscheduled, but DMT and psilocybin are DEA scheduled and prohibited). Reflecting these challenges, the FDA

announced that it is working with the National Association of Convenience Stores and the National Smoke Shop Association to raise consumer awareness about the recall and warn consumers about purchasing or consuming the product.[2] Relatedly, in addition to continued product marketing and availability of this now recalled product, we also detected 12 social media user-generated posts discussing purported adverse events, including a self-reported hallucination and severe adverse health experience after consuming two Diamond Shroomz chocolate bars. This indicates that continued adverse event surveillance is important in this post-recall period, particularly in the context of users who may not report their adverse event experiences to poison control centers or do not end up hospitalized.[18–20]

Limitations of this study include a relatively short time period after recall initiation to conduct market surveillance, legal and ethical limitations that restricted our ability to conduct real-world test buys of actual products that have been recalled that necessitated simulated purchasing, and lack of complete licensure data to assess all vendor status.

Methodology

1**Data Collection**

- Search Engine results data mining
- Social Media results data mining

2**Product sold (Pre-recall)**

- Identified social media posts and search engine vendors that were selling Diamond Shruumz prior to the manufacture recall on June 27, 2024.
- Documentation of product availability from search engine vendors and age verification when entering website

3**Test Purchasing (Post-recall)**

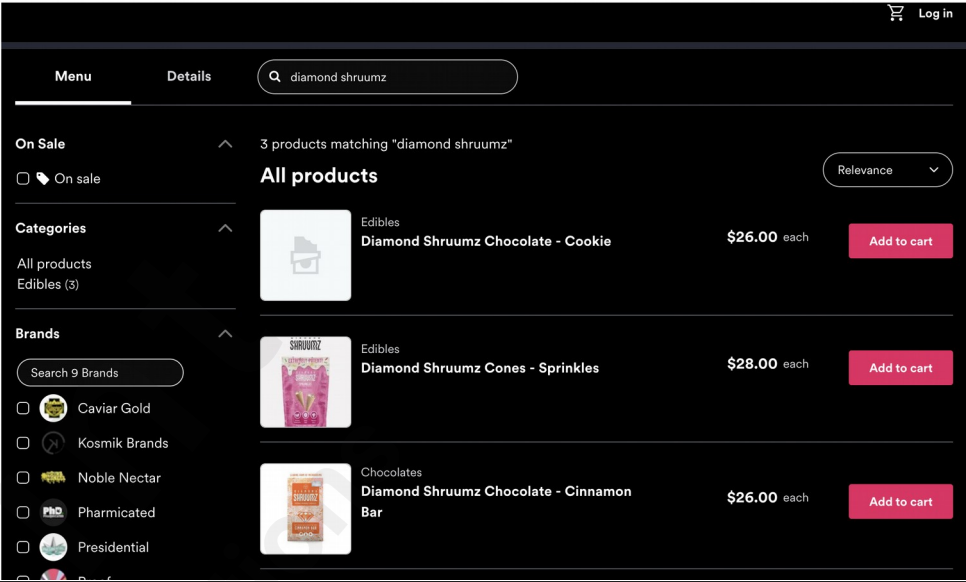
- Identified if product was still available from social media posts and search engine vendors.
- Documentation of recall notice availability, purchase process, payment options, age verification (during checkout), and completion of purchase

Figure 1. Summary of study methodology including online market availability, website monitoring, and simulated test purchasing after recall.

Table 1: Summary table of social media queries, cannabis e-commerce platforms, and internet search queries

Platforms	Total Aggregate	Advertised Product Listings (Pre-FDA Recall)	Simulated Purchases (Post FDA Recall)
Social media queries			
Instagram Posts	(n=1103)	33 (67.35%)	Original signal product listing unavailable 0 (0%)
Reddit Posts	(n=20)	0 (0%)	0 (0%)
Telegram Posts	(n=2)	2 (4.08%)	Original signal product listing unavailable 0 (0%)
Tumblr Posts	(n=16)	0 (0%)	0 (0%)
Twitter/X Posts	(n=399)	14 (28.57%)	1 (100%)
Instagram user-generated comments	(n=52)	0 (0%)	0 (0%)
Reddit user-generated comments	(n=8)	0 (0%)	0 (0%)
Total Social media queries	1600	49	1
Cannabis e-commerce websites			
Dutchie Shops	(n=1)	1 (12.5%)	1 (50%)
Leafly Shops	(n=5)	5 (62.5%)	0 (0%)
Weedmaps Shops	(n=2)	2 (25%)	1 (50%)
Total e-commerce shops	8	8	2
Internet Search Queries			
Unique Domains	(n=237)	67 (28.27%)	15 (33.33%)


Table 2: Example of simulated purchases post manufacturer-initiated recall

	Platform	Example
Social media Posts	Twitter	 A screenshot of a website's search results page for the query "diamond shruumz". The page has a dark theme. On the left is a sidebar with navigation options: "Menu", "Details", "On Sale" (with a toggle switch), "Categories" (listing "All products" and "Edibles (3)"), and "Brands" (with a search bar and a list of brands including Caviar Gold, Kosmik Brands, Noble Nectar, Pharmicated, and Presidential). The main content area shows "3 products matching 'diamond shruumz'" and a dropdown menu set to "Relevance". Under the heading "All products", three items are listed: 1. "Diamond Shruumz Chocolate - Cookie" (Edibles) for \$26.00 each, with an "Add to cart" button. 2. "Diamond Shruumz Cones - Sprinkles" (Edibles) for \$28.00 each, with an "Add to cart" button. 3. "Diamond Shruumz Chocolate - Cinnamon Bar" (Chocolates) for \$26.00 each, with an "Add to cart" button. Each item includes a small product image.

Search main	Primechocolatestore	PRODUCT
		Diamond Shruumz Mint Chocolate Chip 2pc x 1
		Subtotal:
		Shipping:
		Payment method:
		Total:

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Disclaimer: The opinions expressed are those of the authors alone.

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Ethical Compliance: Not applicable/Not required for this study. All information collected from this study was from the public domain and the study did not involve any interaction with users. Any user identifiable information was aggregated and/or removed from the study results.

Supplementary Files

Multimedia Appendixes

eSupplement.

URL: <http://asset.jmir.pub/assets/b3c64da86eb3dddf9c4525c3e80f8c82.docx>