



Vape shop owners'/managers' attitudes about CBD, THC, and marijuana legal markets

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ABSTRACT

Over the past decade in the US there have been marked pivotal changes in the policy and retail environment regarding cannabinoids, particularly cannabidiol (CBD) and delta-9-tetrahydrocannabinol (THC). Many vape shops may carry products relevant to these two markets. This study interviewed vape shop owners/managers to assess their perceptions of consumer interests/behaviors regarding CBD and THC and of the impact of legalized marijuana retail on vape shops. The current study involved phone-based semi-structured interviews of 45 vape shop owners/managers in six metropolitan statistical areas (MSAs; Atlanta, Boston, Minneapolis, Oklahoma City, San Diego, and Seattle) during Summer 2018. Overall, 82.2% of participants were male, 77.8% were non-Hispanic White, 64.4% were managers, 8.9% reported past 30-day smoking, and 95.6% reported past 30-day vaping. Overall, 44.4% sold e-liquids containing CBD. Vape shop owners/managers indicated minimal perceived risk and some beliefs in therapeutic benefits of CBD products; however, there was a broader range of perspectives regarding marijuana retail and selling marijuana for recreational use. Some chose to distance themselves from marijuana products, their use, and the possibility of entering marijuana retail if it were to evolve in their state, while some indicated high levels of enthusiasm for the growing retail marijuana market. Future research should examine how vape shops and other retailers of CBD and marijuana communicate with consumers about products and modes of using such products, as well as how various industry sectors (e.g., vape shops) adapt or evolve with increasing regulation of nicotine and increasing legalization of marijuana retail.

1. Introduction

The past decade has marked pivotal changes in policy and the retail environment regarding cannabis in the US. Cannabis sativa is one of three primary species of cannabis and contains more than 100 cannabinoids. (National Academies of Sciences E, and Medicine, 2017) The two most prevalent cannabinoids are 1) cannabidiol (CBD), which has no intoxicating effects, and 2) delta-9-tetrahydrocannabinol (THC), cannabis' main psychoactive constituent. (Pisanti et al., 2017) Hemp and marijuana are two strains of cannabis sativa: hemp contains high

CBD levels but little THC ($\leq 0.3\%$), while marijuana contains both compounds, with levels of THC reaching as high as 80%. (Congress, 2018; Institute, 2020) Marijuana is the most commonly used federally illicit drug in the US. (Substance Abuse and Mental Health Services Administration, 2020) Use prevalence of CBD products is not as well documented. Among US adults, ~26% have tried CBD, with ~14% reporting daily use. (Goes, 2019)

Cannabis sativa has been included in the Controlled Substance Act since 1970, making it federally illegal and a Schedule 1 drug. (Congress, 1970) However, the Agriculture Improvement Act of 2018 (Congress,

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2018) removed hemp from the Controlled Substance Act but preserved the Food and Drug Administration's (FDA's) authority to regulate CBD under the Federal Food, Drug, and Cosmetic Act. (Food et al., 2015) This resulted in rapid increases and diversification of CBD-infused products. (Food and Drug Administration. Statement from FDA Commissioner Scott Gottlieb, MD, on new steps to advance agency's continued evaluation of potential regulatory pathways for cannabis-containing and cannabis-derived products [press release]. April 2, 2019) Hemp-derived CBD can be legally purchased in most states; marijuana-derived CBD is illegal at the federal level. However, as of January 2020, 33 states allow medical marijuana, (Global, 2020) and 11 states and DC allow recreational marijuana use. (Macnamara, 2020) FDA is currently evaluating the regulatory framework for CBD products and determining the need for new regulations. (Food and Administration, 2019)

Although FDA prohibits marketing therapeutic benefits of CBD, 62% of CBD users report its use to treat medical conditions, most commonly pain (e.g., chronic pain, arthritis). (Corroon and Phillips, 2018) Moreover, a third of users report taking CBD in addition to an existing prescription or over-the-counter medication, and 22% of users reported replacing an existing medication entirely, (Goes, 2019) potentially increasing risk for unintended consequences (e.g., adverse drug events). (Goes, 2019; Food and Drug Administration, 2018)

Likewise, most states with legalized marijuana retail for recreational use prohibit health claims in marketing. (Center and Tobacco, 2020) This is critical, as marijuana use is related to negative effects (e.g., on mental or physical health, cognitive, academic or occupational performance), particularly in young people. (National Academies of Sciences E, and Medicine, 2017; Cohen et al., 2019; Meier et al., 2016; Auer et al., 2016; Volkow et al., 2014; Epstein et al., 2015; Meier, 2012; Toumbourou et al., 2007; Tucker et al., 2005; Crane et al., 2013; Ramaekers et al., 2006; Johnston, 2016; Monitoring the Future., 2018; Patte et al., 2017) Furthermore, THC has been implicated in e-cigarette/vaping-associated lung injuries (EVALI). (Centers for Disease Control. Outbreak of Lung Injury Associated with the Use of E-Cigarette, or Vaping, Products. Centers for Disease Control. https://www.cdc.gov/tobacco/basic_information/e-cigarettes/severe-lung-disease.html. Published, 2019) As of January 2020, 82% of hospitalized EVALI patients reported using THC-containing products, and 33% reported exclusive use of THC-containing products. (Centers for Disease Control. Outbreak of Lung Injury Associated with the Use of E-Cigarette, or Vaping, Products. Centers for Disease Control. https://www.cdc.gov/tobacco/basic_information/e-cigarettes/severe-lung-disease.html. Published, 2019) Indeed, 20% of adult marijuana users report vaping marijuana in the past month. (Schauer et al., 2020) Additionally, of those ever using vaping devices, 14.9% indicated vaping only marijuana, 29.6% only nicotine, and 7.8% both. (Trivers et al., 2019) Also of note is the increasing trend of CBD vaping; for example, one popular CBD vape pen (FX vape pen) sales increased 2.5 times from 2017 to 2019. (Gammon et al., 2020)

Little research has examined the extent to which CBD or THC products are being sold by vape shops (typically been defined as those selling vaping devices and nicotine e-liquids but not conventional tobacco products). (Lee et al., 2018) Intuitively, the increasing prevalence of vaping marijuana, particularly in states with legalized marijuana, (Goodman et al., 2020) suggests that vape shops may profit from catering to CBD and/or marijuana consumer markets. (Tully, 2020) One study examined the New Hampshire vape shops and head shops (Kong et al., 2017) (e.g., outlets specializing in smoking products and accessories [e.g., hookah tobacco/pipes, blunt wraps, bong], including vaping products Giovenco, 2018). Despite neither CBD- nor THC-containing products being legal in New Hampshire, 6% of vape shops and 47% of vape/head shops sold CBD- and/or THC-containing products. (Kong et al., 2017) In addition, our prior research in vape shops across six metropolitan statistical areas (MSAs) indicated that 43% sold CBD e-liquids and 23% sold other CBD-containing products, with THC-

containing products being less visible or evident. (Berg et al., 2020)

Given the expanding CBD and marijuana markets and their potential relevance to the vape shop industry, it is important to understand vape shop owners'/managers' experiences with or attitudes about the CBD and marijuana markets. The limited research on this topic suggests that a qualitative research approach is optimal for obtaining in-depth information on relatively new or not well understood phenomena. (Maxwell, 1992, 2013) Thus, the current study involved semi-structured interviews of vape shop owners/managers across six MSAs in six states with distinct CBD and marijuana legislative contexts in Summer 2018. This study aimed to assess their: 1) perceptions of consumer interests and behaviors regarding CBD and THC; 2) perceptions of legalized recreational marijuana retail impact on the vape shop industry; and 3) interest in entering marijuana retail.

2. Methods

2.1. Participants and Procedures

The Vape shop Advertising, Place characteristics and Effects Surveillance (VAPES) study examines the vape shop retail environment in six MSAs: Atlanta-Sandy Springs-Roswell (Georgia); Boston-Cambridge-Newton (Massachusetts); Minneapolis-St. Paul-Bloomington (Minnesota); Oklahoma City (Oklahoma); San Diego-Carlsbad (California); and Seattle-Tacoma-Bellevue (Washington). These MSAs were selected to represent states along a gradient of tobacco control policy based on American Lung Association's State of Tobacco Control classification. (American Lung Association, 2018) California has the strongest tobacco control across categories (tobacco and prevention, access to cessation, tobacco taxation, tobacco 21 [T21]), followed by Massachusetts and Minnesota. Georgia has the weakest, with Oklahoma also being notably weak. This gradient also applies to vaping. For example, California and Minnesota tax vaping products; California, Minnesota, and Washington require licenses for retail sales of vaping products. (Center, 2019) No states had zoning laws for vape shops at the time of assessment. (Center, 2019) Notably, California and Washington also had retail markets for recreational use of marijuana at the time of assessment. (Center and Tobacco, 2020)

Shop owners/managers were invited to participate in semi-structured interviews during the process of conducting 179 point-of-sale assessments across the six MSAs (~30 in each MSA). (Berg et al., 2020) The sampling frame of the vape shops assessed are detailed elsewhere. (Berg et al., 2020) In brief, we searched "vaporizer store" on Google and "vape shops" on Yelp to identify stores in the six states tagged by retailers or customers as vape shops, restricted lists to stores with complete addresses, eliminated duplicate entries, geocoded records to latitude/longitude using ArcGIS v10.1, used a telephone protocol to confirm that stores met eligibility criteria (i.e., sold vape products but not other tobacco products), and then randomly selected 30 vape shops within 25 miles of the MSA centroid for point-of-sale assessments.

Shop owners/managers of the 179 vape shops assessed were contacted via email and/or phone call to assess/confirm willingness to participate and schedule an interview; 140 owners/managers indicated interest in participating in qualitative interviews (communicated in person at the time of the point-of-sale audit or via email/phone). Overall 80 (57.1%) consented when called to complete/schedule the interview, and 45 (56.2% of those who consented [45/80] or 25.1% of the sample of 179 vape shops [45/179]) participated in the interviews. (Loss of those consented was largely due to inability to reach those who consented at times scheduled for interviews.) Participation rates varied across the MSAs: 22% in Oklahoma City; 20% in Seattle; 18% in Atlanta, Boston and Minneapolis, respectively; 10% in San Diego.

2.2. Data Collection

Merchant interviews were conducted July-September 2018. The

COREQ (CONsolidated criteria for REporting Qualitative research) guidelines guided data collection and analyses. (Tong et al., 2007) The interview guide was developed and pilot-tested through mock interviews, then revised (after three interviews) to ensure clarity and comprehensiveness. Interviews assessed:

- 1) *Consumer interests and behaviors regarding CBD and THC products* (i.e., To what extent do you feel your device market is influenced by consumers looking to use them with CBD or THC e-liquids, oils, or other products? What concerns do you have about CBD or THC use with the devices you sell? What concerns would you have about health for people using these devices with CBD or THC e-liquids, oils, etc.);
- 2) *Retail marijuana legalization impact (among states with marijuana retail) or future impact (among states without)* (i.e., How [has/might have] legalizing recreational marijuana impact[ed] your market? To what extent do you think it [had/would have] positive or negative impacts on your shop?);
- 3) *Interest in entering marijuana retail* (i.e., To what extent [have or might] you consider[ed] entering the marijuana market?); and
- 4) *Participant and vape shop characteristics* (i.e., using short-answer/survey-type questions).

Interviews (~15–30 mins in duration) were facilitated by four MPH graduate students (1 male, 3 female) trained in qualitative data collection and were audio-recorded for subsequent coding. Participants were compensated via \$30 Amazon e-gift cards.

2.3. Data analysis

Qualitative data were analyzed using MAXQDA 12 (Berlin, Germany: <http://www.maxqda.com/>) and thematic analyses. Two authors (trained MPH-level study personnel) independently reviewed all transcripts, which they then used to generate preliminary codes using deductive and inductive coding methods. (Maxwell, 1992) Codes were compiled and developed into a codebook for analysis. Primary (i.e., major topics) and secondary codes (i.e., recurrent themes within primary topics) were established. Then, each transcript was fully and independently analyzed by two additional MPH graduate students and coded using the preliminary codebook. New codes that arose during coding were added to the codebook and applied to all transcripts. At the completion of independent coding, agreement among coders was analyzed (Kappa = 93.3%), and then consensus for coding was reached. Final codes were used to identify themes, and relevant and representative quotes were chosen based on representativeness and clarity. Balancing the controversy in qualitative research regarding whether to quantify qualitative results, (Maxwell, 2013) we chose to indicate the frequency with which themes were provided by participants by “quantitizing” them as “all” (100%), “almost all” (~90–99%), “most” (~70–89%), “the majority” (~50–69%), “some” (~20–49%), and “a few” (> 20%). (Sandelowski et al., 2009) Additionally, descriptive statistics were conducted to characterize the qualitative study sample, using SPSS 23.0.

3. Results

3.1. Participant & Vape Shop Characteristics

Participants were predominately male (82.2%) and non-Hispanic White (77.8%); average age was 36.2 (SD = 11.4; Table 1). Most participants (64.4%) were managers; 73.3% had been employed at their vape shop ≥ 2 years. The vast majority (86.7%) reported lifetime cigarette smoking; 8.9% reported past 30-day smoking. All participants reported lifetime vaping; 95.6% reported past 30-day vaping. Chains accounted for 60.0% of vape shops; 88.9% were open > 2 years. Overall, 44.4% sold e-liquids containing CBD.

Table 1
Participants and vape shop characteristics, n = 45.

| Variable | M (SD) or N (%) |
|---|-----------------|
| <i>MSA, N (%)</i> | |
| Atlanta | 9 (20.0) |
| Boston | 8 (17.8) |
| Minneapolis | 8 (17.8) |
| Oklahoma City | 10 (22.2) |
| San Diego | 4 (8.9) |
| Seattle | 6 (13.3) |
| <i>Sociodemographics</i> | |
| Age, M (SD) | 36.2 (11.4) |
| <i>Sex, N (%)</i> | |
| Female | 8 (17.8) |
| Male | 37 (82.2) |
| <i>Race/Ethnicity, N (%)</i> | |
| White | 35 (77.8) |
| Other | 10 (22.2) |
| <i>Use History</i> | |
| <i>Cigarette use, N (%)</i> | |
| Ever use | 39 (86.7) |
| Past 30-day use | 4 (8.9) |
| <i>E-cigarette use, N (%)</i> | |
| Ever use | 45 (100.0) |
| Past 30-day use | 43 (95.6) |
| <i>Vape Shop Related Characteristics</i> | |
| <i>Participant position, N (%)</i> | |
| Owner | 14 (31.1) |
| Manager | 29 (64.4) |
| Other | 2 (4.4) |
| <i>Participant employment duration, N (%)</i> | |
| Less than 1 year | 6 (13.3) |
| 1–2 years | 6 (13.3) |
| More than 2 years | 33 (73.3) |
| <i>Chain, N (%)</i> | |
| Yes | 18 (40.0) |
| No | 27 (60.0) |
| <i>Duration of store operation, N (%)</i> | |
| Less than 1 year | 3 (6.7) |
| 1–2 years | 2 (4.4) |
| More than 2 years | 40 (88.9) |
| Offers CBD e-liquids | 20 (44.4) |

Consumer Interests and Behaviors Regarding CBD and THC

Table 2 presents themes and example quotations across themes. With regard to consumer interest in CBD products, some participants indicated that carrying CBD products made sense because they felt that the consumer bases for vaping products and CBD were similar. The majority felt that CBD products were safe, in part because there are no psychoactive effects of CBD. The majority, particularly those who carried CBD products, also indicated that CBD products had utility in helping consumers address physical health conditions, such as pain and insomnia. A few site specific examples of consumers who appeared to benefit from using CBD products. In addition, some indicated that the potential utilities outweighed the minimal risks. Some indicated that consumers would ask about THC-containing products.

Relatedly, the majority reported consumers inquiring about devices or batteries for devices likely to be used for THC-containing products (e.g., e-liquids, waxes). Some participants indicated concern that consumers were potentially using THC-containing products incompatible with the devices. A few participants indicated concern that consumers using CBD for medicinal purposes may not get optimal benefit of CBD if they vaped it or mixed it with other e-liquids. Some participants indicated that they did not need to know how consumers used the devices or that it was the consumer's right and responsibility to use the device as they wanted.

3.2. Impact of Marijuana Retail Legalization on Vape Shop Industry

Some participants in MSAs with legalized marijuana retail suggested positive impacts of the legislation on their business. Some reported that

Table 2

Themes and sample quotes of managers and vape shop owners' responses regarding Impact of marijuana policy on vape markets in legalized states (L) and non-legalized states (NL).

| Themes | Example Quotes |
|--|--|
| Consumer interest and behaviors regarding CBD and/or THC CBD and THC-containing products <i>CBD products coincide with consumer interests</i> | "Our customers request CBD products. And it goes hand-in-hand with, with vaping. A lot of people that vape are also CBD users. And they want to buy their product at the same store they buy their vape shop stuff at." – <i>Boston (NL*)</i> |
| <i>Emphasis that CBD is not psychoactive</i> | "There's a decent demand for [CBD], because they're not psychoactive. They have no narcotic effect or any sort of "high" that you get from them." – <i>Boston (NL*)</i> |
| <i>CBD use for pain and/or chronic illnesses</i> | "I believe the FDA just started looking into using CBD as an anti-epileptic because CBD does tend to slow down the synapses in the brain that cause – where all those signals are just firing in the brain all at once. It tends to slow that down and can actually reverse some epileptic seizures." – <i>Boston (NL*)</i> "We've seen how [CBD] can help people. I have two customers with Crohn's and that's the only way they can eat. I have several people with arthritis, and it helps with their hands, their back, their knees." – <i>Atlanta (NL)</i> "We sell [CBD] because it's been very beneficial for people. I couldn't tell you the lives that I've seen change from taking it and especially in a state like Oklahoma where most majority of the people are super conservative." – <i>Oklahoma City (NL)</i> |
| <i>Potential utility and minimal risk related to CBD</i> | "We have a very limited amount of CBD liquids. It's not a huge source of income for us. However, we do have people that complain of aches and pains and have asked us to bring in a product." – <i>San Diego (L)</i> "My owners definitely decided to carry of [CBD] just because of demand and request and things like that. Also, it really is a really helpful tool for people who have chronic illness or a tough time going to sleep or anything like that. There are studies that show it can be helpful. I don't necessarily know how true that is, but – I mean, there's no psychoactive component, it's not going to get you the traditional high that everyone is familiar with. And doesn't affect you and stuff like that. So if it's able to help people and it doesn't provide a negative effect or anything, then I don't see the harm in it." – <i>Boston (NL*)</i> |
| <i>CBD use to cut down on nicotine</i> <i>Consumer interest in THC products</i> | "Some people also want to use [CBD] to try and cut down on nicotine." – <i>Boston (NL*)</i> "A ton of people who come into my shop even say, 'Well, when are you all gonna start selling the good, good juice, or when are you gonna start selling, you know, the good stuff?'" – <i>Oklahoma City (NL)</i> |
| Devices <i>Consumer interest in devices to accommodate CBD or THC use</i> | "We'd have some people come in subtly hinting at, 'Am I able to use marijuana out of this?' The answer's always been no, but since CBD has become more popular, and the medicinal use of vapor as a form of medicinal marijuana, we've seen a consistency. It's still only maybe one or two people a week, but that's compared to maybe one person every month." – <i>Minneapolis (NL)</i> "I have a lot of people that already have the cartridge that has the liquid in there, or the wax, whatever you want to call it. And they're just looking for the battery or some people want the little tanks." – <i>Oklahoma City (NL)</i> |
| <i>Concern of using products incompatible with devices</i> | "With the stuff that we specifically sell that has CBD, it's not recommended to put it in [the vaping device]. So, that would be the only concern for me is making sure customers know that, if they're getting CBD from us, it's not recommended to put it in your vape." – <i>Oklahoma City (NL)</i> |
| <i>Concern about how vaping impacts effects of CBD</i> | "I have customers come in here trying to use CBD in devices that they're not designed for." – <i>Atlanta (NL)</i> "So my only thing with CBD is it's perfectly fine to use it through a normal device, you know. But what I tell most people is for the most effective use of CBD, it's best used sublingually. Cause when you vaporize it, you lose a lot of the CBD to the vaporization. And if you put it on your tongue it, it just works a lot better. So most people that come in trying to use CBD, especially anyone that's looking for it that doesn't vape already, I won't sell them a device. I'll just sell them the bottle and they'll put it under their tongue and they'll be happy with that." – <i>Atlanta (NL)</i> "What I have been told is that I can put it in my device right now, and I can go ahead and vape on it. What I do have concern about is that since you are diluting CBD with your regular vape liquid, it could dilute it so much that you're not getting any of the effects of it? So I feel like if you do vape on it, you need to vape on straight CBD." – <i>Oklahoma City (NL)</i> |
| <i>Up to consumer how device is used</i> | "When they buy the device, it's totally up to the consumer what they going to do with it. I mean it's not up to me to go out in their homes, and I show you that this liquid and that this liquid, you know – it's up to the consumer – the consumers are going to do regardless with what you give them." – <i>San Diego (L)</i> |
| Impact of recreational marijuana legalization on vape shop industry <i>Positive impact on vape shop industry</i> <i>Expand vape shop consumer base</i> | "[Legalization] been super beneficial. It has opened a new door for customers to come in that normally wouldn't at all. A lot of those people would go to smoke shops, just go buy a pipe or something and continue smoking, whereas they could actually come to a vape shop and not only improve their health because pot is beneficial, in my opinion, but they also are actually improving their health because they're no longer burning it, they're vaping it. And they're also providing to the community by buying from local shops and stuff like that, or instead of buying stuff online." – <i>Seattle (L)</i> "Most people that are using [marijuana] recreationally will just go to a rec shop because it is legalized. They know that that's the specialty. However, if they know that we have something that they want cannabinoid wise, they can just come in when they get their e-cig juice, and they can kill two birds with one stone that way." – <i>Seattle (L)</i> |
| <i>Increased device demand, offerings, and sales at vape shops</i> | "Before, we had just like a couple of herb vapes here and there; we have like one concentrate style pen. And then once [marijuana] became legalized and there was more access to the concentrates and different things, even the prefilled cartridges, people come in and bought a normal vape pen just for their prefilled cartridges, so we got more of those. We also got just more varying products just for different styles of stuff." – <i>Seattle (L)</i> "A lot of people are just looking for small batteries or something for, like, cartridges. A lot of people don't explicitly state what it is. Obviously, working there, I can kind of tell what purpose it's being used for. With it being legal in the state, they can talk about it if they want. If they don't want to, that's fine, too. But it definitely has increased since legalization in Massachusetts so..." – <i>Boston (NL*)</i> "If I had to say something about marijuana, it had a positive effect on revenue. It added about 5–10% in sales." – <i>Seattle (L)</i> |
| <i>Expand appeal to current vape shop consumers</i> | "I think it would increase sales a lot because the two communities are really similar and you could kinda like combine what we already have with that." – <i>Atlanta (NL)</i> |
| <i>No impact on vape shop industry</i> <i>Different market</i> | |

(continued on next page)

Table 2 (continued)

| Themes | Example Quotes |
|---|---|
| | <p>“I think it’s going to be minimal, to be honest. You know why? Because people who smoke, they want their nicotine. People who are addicted to nicotine, the weed’s not going to help that. At the end of the day, if they go smoke a bowl, they’re still going to want the nicotine after the bowl. Or, if people are smoking cigarettes in general, I think it’s a very small number of people who just smoke weed to get off cigarettes.” – <i>Boston (NL*)</i></p> <p>“I don’t think that it would affect the business in the long run. Because I don’t think smoking marijuana has much to do with the vaping industry.” – <i>Atlanta (NL)</i></p> <p>“That’s kind of too early to say just because well, recreational is not legal. It’s just not apples and apples. If somebody wants to smoke marijuana then a lot of times after that then they smoke cigarettes. But if they’re not – our goal is to get them not to smoke cigarettes but to vape. So marijuana is on a total different level and hopefully should not affect us at all.” – <i>Oklahoma City (NL)</i></p> |
| Limited impact on vape shop sales | <p>“I honestly think it would just be completely neutral. I don’t think it would have an impact one way or another with the legalization. I mean we’d probably sell more devices. So for business, yeah. But for vaping as a whole, probably not.” – <i>Atlanta (NL)</i></p> |
| Negative impact on vape shop industry Decreased device sales at vape shops | <p>“So, we do sell glass pieces and things like that, and herbal vaporizers. But we don’t sell any of the actual herb itself. However, a lot of the recreational shops that are going to start opening up are probably going to start carrying all of the electronic herbal vaporizers we currently stock which could impact our business because not only are they able to get that there, they’re also able to get the stuff they want to put in it there. So that would be like, ‘Oh, two birds with one stone. Why would I shop in a vape shop? This way I can get it in the same place.’” – <i>Boston (NL*)</i></p> <p>“I think people that are going to dispensaries, if they want to vape they’re going to buy their vapes from the dispensary. I don’t think they’ll go to a vape shop.” – <i>Atlanta (NL)</i></p> |
| Vape shops forced to be a headshop | <p>“Me and my business partner, we never wanted to be a head shop, but it looks like we’re going to be forced to. We’re going to bring in items that almost have to cater to weed, so it’s going to be more of a vape shop and I guess a head shop if you call me back in about six months or so.” – <i>Boston (NL*)</i></p> |
| Perceived unfairness of regulations of recreational marijuana vs. vaping | <p>“Well, it’s pissed me off to tell you the truth, because everybody is for it, and they’re all against us. So I don’t understand how can you be all for cannabis but then you can be all against vaping? It makes absolutely no sense.” – <i>San Diego (L)</i></p> |
| Interest in entering marijuana retail for marijuana use No interest Minimal consideration | <p>“Yeah, there was never a consideration. That was totally not part of the conversation. We’re not going to bring that type of product in the store.” – <i>San Diego (L)</i></p> <p>“Most other vape shops in the state have kinda turned into half head shop, half vape shop, because of [legalization]. But I haven’t done that, because I just don’t want to. I have no interest in selling cannabis products.” – <i>Boston (NL*)</i></p> |
| Inconsistent with or not part of company goals/mission | <p>“We personally as a company, we’re aiming more for helping people quit smoking cigarettes, or chewing tobacco, whichever your bread and butter is. We’re more aimed at helping people drop those habits than anything else. So to consider changing it up into a marijuana industry wouldn’t really make much sense for us. That goes for vaping as well, you know? We’re not trying to keep people on vaping forever because I’ve developed relationships with customers and maybe a couple of months later when they’re ready to drop everything completely, that’s when I see them last.” – <i>Seattle (L)</i></p> <p>“We would definitely get a lot more questions as to when are we gonna start carrying devices that will work with marijuana. You know we stayed firm on the point that we’re a shop that sells e-cigarettes. Our mission is to get people away from smoking. You know it’s not our job to cater to whatever’s popular at that time. You know that’s what’s kept us very successful – sticking with the mission that we’re here to help people quit smoking. We have had conversations about the, the potential of recreational marijuana and that’s not a direction we’re going to be going in.” – <i>Minneapolis (NL)</i></p> <p>“I didn’t get into this to help people smoke. And I think that once you burn anything and put that in your body, no matter what it is, it leads to additional health problems. I wouldn’t feel comfortable going in to work every day knowing I would be contributing to that.” – <i>Atlanta (NL)</i></p> <p>“Probably one out of every three people that comes into the store asks when are we going to start carrying ‘the good stuff’ or things like that. And it’s like, ‘We won’t. You know, we’re a vape shop.’ You know, go into the bar and ask them when they’re gonna start passing out joints.” – <i>Boston (NL*)</i></p> |
| Other limitations (e.g., financial resources) | <p>“I don’t have the money. I don’t have the capital. I don’t use it myself, so I would not be educated or knowledgeable for the product that was being sold. All the permit and licensing required is extensive and expensive, and the locations, both locations of my storefront do not allow for sales of cannabis either, even if it was something that I wanted to do. It would not be allowed.” – <i>San Diego (L)</i></p> |
| Interested Interest in entering market as an additional storefront | <p>“I’ve considered entering it as a complete separate business venture. I wouldn’t do it as anything related to my current vape business. I’m an entrepreneur; I like to make money, so I have nothing against cannabis, but I wouldn’t mix the two. I have very specific goals in my vape shops.” – <i>Boston (NL*)</i></p> |
| “Splitting” the current storefront | <p>“If weed ever did become legal, I would definitely kinda turn half of my store into a medicinal shop. Because of all the good benefits that it does have and I don’t know, it’d be fun to learn something new.” – <i>Atlanta (NL)</i></p> <p>“If the boss ended up wanting to go that route, I’d see it being more of a split between the shop. You’d have the front half where you’ve got your vaping stuff, you’ve got the back half where you can get your other stuff...” – <i>Minneapolis (NL)</i></p> |
| Interest in increasing product availability/profitability | <p>“I think the only changes that we would go through is that we would increase the amount of product that we would carry, that people are able to use their THC or oils with. We’ve talked about it. We would open up another store. Even if we didn’t open up a marijuana store, we would increase the amount of products that we use for people to use their THC with.” – <i>Oklahoma City (NL)</i></p> <p>“You’d definitely have to adapt what you sell. If it was legal here, my devices would look a little bit different than they do currently. But I would still carry the core vape devices at heart. And then have a few things for the people that straggle in wanting something to enjoy their legal green with. I imagine most shops are gonna stay pretty much the same and head shops will just reign supreme because they already sell all those devices, you know.” – <i>Atlanta (NL)</i></p> <p>“It might open the door to other products that the vape shops could sell. It opens up a completely new market for us. And, some of the equipment, some of the hardware, the pens and stuff, um, can be used with either.” – <i>Atlanta (NL)</i></p> |

(continued on next page)

Table 2 (continued)

| Themes | Example Quotes |
|---|--|
| <i>Interest in switching to a recreational marijuana retailer</i> | <p>"I don't think it would change how our business is. It might increase the business a little bit because we do have several people from Colorado or from up the street that they get the tank but they don't have a battery." – <i>Oklahoma City (NL)</i></p> <p>"Probably pretty likely just because we already have the customer base of people who come in for their vape products and now people who come in for their CBD products. So it wouldn't be too far of a leap for like to also have those people come in for their marijuana product." – <i>Oklahoma City (NL)</i></p> <p>"I remember [the owner] talking to me about it. We both support it, and she mentioned that she would want to turn [the vape shops] into dispensaries and would go through whatever she has to 'cause that's honestly where the money is. There's money in vaping, there's way more money in legal marijuana, especially with Colorado's numbers." – <i>Minneapolis (NL)</i></p> |

marijuana retail expanded the vape shop consumer base to include those interested in a range of vaping devices for marijuana use and CBD products. Some participants in these MSAs and in the emerging marijuana retail market in Boston indicated that they increased the number of types of devices that accommodate marijuana use (e.g., waxes, herbs) to engage a broader consumer base. Moreover, some indicated that their current vape shop clientele would increase their consumerism because they would have another reason to spend money at their vape shops (i.e., to buy other types of devices).

Some participants thought that marijuana retail would not impact the vape shop industry. Interestingly, contrary to what others indicated, some felt that the consumer bases for vaping products versus marijuana were quite different. Others thought that device sales might increase, but that the impact on business would be negligible.

Some believed that marijuana retail had or would have a negative impact on the vape shop industry. Some believed that device sales would decrease as marijuana retailers offered devices to accommodate various marijuana products (e.g., e-liquids, dry leaves, waxes). Some also reported concern that, in order to be competitive or survive a new context, they would have to diversify product offerings by shifting their shops to reflect a head shop paradigm. Finally, in the context of these perceived negative impacts, some reported disillusionment with the trend toward increasing marijuana legalization during a time of increasing regulations on nicotine vaping products.

3.3. Interest in Entering Marijuana Retail

Questions about interest in selling marijuana for recreational use as it was legalized or if it were legalized in the future elicited a range of responses. Some said that they did not consider it. Some indicated considering it but that it did not align with their company's goals or mission (reportedly to help smokers switch to vaping and/or quit using nicotine altogether). Some also indicated that various other considerations limited their interest (e.g., insufficient funds to enter the market, limited bandwidth to learn about a new market).

Among vape shop owners/managers without legal recreational marijuana retail, the majority expressed some level of interest in adapting their current business to a new retail marijuana market. A few mentioned keeping vape shops and marijuana retail as separate business entities. A few discussed "splitting" their current store to cater to traditional vape shop clientele while developing a marijuana consumer base. Roughly half indicated some adaptations to their current product offerings, particularly expanding device types, to capitalize on opportunities to expand their consumer base. A few indicated interest in converting to marijuana retail completely.

4. Discussion

Within the literature regarding vape shops, prior research indicates a large proportion (~45%) of vape shops carry CBD and/or THC products. (Kong et al., 2017; Berg et al., 2020) However, to our knowledge, no prior research has asked vape shop merchants about their

perceptions of CBD or marijuana products, their interest in those markets, or their perceptions about legalized marijuana retail. Findings from the current study indicated few areas of consensus across topics explored.

One area of consensus was limited perceived harm or risk related to CBD product use, coinciding with prior survey results among US adults. (Goes, 2019) Vape shop owners/managers reported consumers using CBD products for various reasons, including pain relief and sleep management. Prior research has documented that the most common reasons US adults use CBD are for stress/anxiety (37%) and joint pain (24%). (Goes, 2019) However, making claims or implying that CBD products are effective for these purposes are prohibited by FDA. In 2019, FDA issued warning letters to CBD manufacturers and retailers for posting unsubstantiated health claims online (e.g., related to slowing progression of Alzheimer's, pain symptom relief, inhibiting cancer cell growth, etc.). (Food et al., 2020) To date, no warnings have been issued to brick-and-mortar retailers for illicit health claims about CBD, which is notable considering roughly three-quarters of CBD users report purchasing CBD from brick-and-mortar retail. (Goes, 2019; Brennan, 2019) It is unclear whether such claims are not advertised or if surveillance of brick-and-mortar retail is insufficient to document them making such claims. The latter is likely; there is a dearth of research regarding CBD availability and marketing practices at brick-and-mortar retail in general. The possibility of such claims within vape shops is high, given current findings. Specifically, many vape shop owners/managers believe that CBD poses minimal risk and offers potential health benefits, and some provide advice regarding how to maximize the effects of CBD products. Thus, current findings underscore the importance of FDA taking action to ensure that brick-and-mortar retailers do not make such illicit health claims regarding CBD.

Research regarding marijuana marketing has been emerging. Some research has examined marijuana advertising online via dispensary websites and social media, (Krauss et al., 2017; Caulkins, 2018; Bierut et al., 2017; Ayers et al., 2019; Cavazos-Rehg et al., 2014, 2018; Berg et al., 2017) and only a couple of studies have examined marijuana retailer marketing and point-of-sale practices. (Berg et al., 2018; Cheney et al., 2016) The literature underscores the importance of considering vaping of marijuana (Schauer et al., 2020) and potentially the role of vape shops in marijuana vaping. Current findings highlight that some proportion of marijuana users approach vape shops with their interests in THC-containing products and for devices to use with THC products.

Relatedly, vape shop owners/managers in this study had divergent ideas about their role in responding to consumer interests in marijuana. Some held a strong line between their business and marijuana, not wanting to respond to consumers' interests/inquiries. Some owners/managers indicated that what consumers decided to do with the devices they sold was not relevant to them. Some reported concern about inappropriate use of devices with marijuana products.

Along these lines, there were distinct responses regarding vape shop owners'/managers' interest in entering marijuana retail if it were to be legalized in their state; some owners/managers reported no interest in

shifting their business or product offerings. For many of them, their beliefs that vaping represents a healthier alternative to smoking and potential cessation aid (Hart et al., 2016; Tsai et al., 2016; Nayak et al., 2016) are what drives their business mission (Mincer, 2016) – thus making marijuana retail inconsistent with their mission. Others not interested in entering marijuana retail were limited by barriers, such as financial resources or the need to learn about a new industry. The larger proportion indicated some efforts to accommodate consumers' interests in marijuana products within a new marijuana retail context, by carrying more diverse device types usable with various marijuana products (e.g., dry leaves, waxes), dividing their current store front to maintain their vape shop brand but also to cater to new device types, or opening a new/different marijuana-focused store.

Interestingly, no prior research has explicitly or objectively examined how vape shops adapt to or are impacted by the emergence of marijuana retail. This study documented that some participants in states with marijuana retail indicated that recreational marijuana expanded the vape shop consumer base and that increasing the device variety accommodating marijuana products was helpful in engaging more consumers. Popular press coverage underscored some of these possibilities with regard to medicinal marijuana legalization. (Garciotaa et al., 2016) However, the current study was exclusively focused on vape shops *not* selling other tobacco products (i.e., not including head shops). Given current findings that some vape shops would consider a head shop paradigm in a new marijuana retail context, future research might examine the evolution of vape shops versus head shops (i.e., head shops diversifying to carry vaping products or vape shops diversifying to carry other tobacco products/accessories).

Among participants in states without legalized marijuana retail, perspectives were diverse (e.g., anticipating negative, positive, or no impact). These diverse perspectives might be driven by a couple of underlying themes, specifically whether owners/managers: 1) believed that the consumer base for their vape shop and for marijuana might align; and 2) might adapt their business if marijuana retail was legalized.

Current findings have implications for research and practice. First, more comprehensive research is warranted regarding how vape shop personnel relay to consumers information about CBD and THC products, potential health risk/benefits, and effects/risks of vaping these products. Moreover, it is critical to objectively examine how recreational marijuana retail legalization impacts the vape shop industry and these types of communications with consumers, as well as potential shifts for some owners/managers from their mission of promoting/facilitating smoking cessation or harm reduction.

5. Limitations

Given the nature of qualitative research in general and the nature of the current semi-structured interview study specifically, (Maxwell, 2013) these findings may have limited generalizability to other vape shops and vape shop merchants in the MSAs, across the US, and across the world. As a convenience subsample, these shops may lack generalizability to even the full pool of study shops, though employee characteristics reflect the demographic and tobacco/e-cigarette use behavior norms of those who work in vape shops, per prior research. (Kong et al., 2017; Berg et al., 0000) Nayak et al., 2018 Moreover, there is the possibility that social desirability encouraged participants to minimize certain behaviors, particularly those that might reflect non-compliance with FDA regulations, such as communicating health benefits of CBD. However, we did not explicitly assess this, nor participants' knowledge or perceptions of FDA regulation of CBD products. Finally, much has changed in the US since these interviews were conducted, particularly given the rapidly changing attitudes towards and use of CBD and marijuana products. (Substance Abuse and Mental Health Services Administration, 2020; Goes, 2019) This limitation underscores the need for active surveillance of regulatory impact in this rapidly

changing consumer market and regulatory environment. Still, these results remain timely, and interviews were conducted in six MSAs, which suggests relatively high generalizability compared to previous vape shop studies. (Kong et al., 2017; Berg et al., 0000)

6. Conclusions

Despite vape shop owners/managers largely indicating minimal perceived risk and some beliefs in therapeutic benefits of CBD products, there was a broader range of perspectives regarding selling marijuana for recreational use. Some chose to distance themselves from marijuana products, their use, and the possibility of entering marijuana retail if it were to evolve in their state, while some indicated high levels of enthusiasm for the growing retail marijuana market. Future research is needed to expand on how vape shops and other retailers of CBD and marijuana communicate with consumers about products and modes of using such products, as well as how various industry sectors (e.g., vape shops) adapt or evolve in a policy context with increasing regulation of nicotine and deregulation of marijuana.

CRedit authorship contribution statement

Carla J. Berg: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing - original draft, Writing - review & editing. **Beteliem Getachew:** Conceptualization, Investigation, Methodology, Project administration, Formal analysis, Supervision, Writing - review & editing. **Kim Pulvers:** Conceptualization, Investigation, Methodology, Writing - review & editing. **Steve Sussman:** Conceptualization, Investigation, Methodology, Writing - review & editing. **Theodore L. Wagener:** Conceptualization, Investigation, Methodology, Writing - review & editing. **Christina Meyers:** Conceptualization, Data curation, Validation, Writing - review & editing. **Amy Park:** Conceptualization, Data curation, Validation, Writing - review & editing. **Sarah Dorvil:** Conceptualization, Data curation, Validation, Writing - review & editing. **Akilah Patterson:** Conceptualization, Data curation, Validation, Writing - review & editing. **Amber Weber:** Conceptualization, Data curation, Validation, Writing - review & editing. **Dianne C. Barker:** Conceptualization, Investigation, Methodology, Project administration, Formal analysis, Supervision, Writing - review & editing. **Lisa Henriksen:** Conceptualization, Funding acquisition, Investigation, Methodology, Project administration, Resources, Writing - review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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