



Research paper

Consumer use and understanding of labelling information on edible marijuana products sold for recreational use in the states of Colorado and Washington



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ABSTRACT

Background: In 2014, the states of Colorado and Washington began allowing retail sales of marijuana for recreational use. The regulatory agencies in these states have implemented specific labelling requirements for edible marijuana products sold for recreational use to help address concerns such as delayed activation time, accidental ingestion, and proper dosing.

Methods: We conducted 12 focus groups with 94 adult consumers and nonconsumers of edibles in Denver and Seattle to collect information on their use and understanding of labelling information on edible marijuana products sold for recreational use. Specifically, we asked participants about the usefulness, attractiveness, ease of comprehension, relevancy, and acceptability of the label information.

Results: Some focus group participants look for and read specific information, such as the potency profile and serving size statement, but do not read or were unfamiliar with other labelling features. The focus groups revealed that participants have some concerns about the current labelling of edibles. In particular, participants were concerned that there is too much information on the labels so consumers may not read the label, there is no obvious indication that the product contains marijuana (e.g., a Universal Symbol), and the information on consumption advice is not clear. Participants in both locations suggested that education in a variety of formats, such as web- and video-based education, would be useful in informing consumers about the possible risks of edibles.

Conclusion: The focus group findings suggest that improvements are needed in the labelling of edibles to prevent unintentional ingestion among adult nonusers and help ensure proper dosing and safe consumption among adult users. These findings, along with lessons learned from Colorado and Washington, can help inform the labelling of edibles as additional states allow the sale of edibles for recreational use.

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Introduction

In 2012, Colorado and Washington became the first two states in the United States to legalize marijuana for recreational use with retail sales starting in 2014. In 2014, Oregon and Alaska legalised marijuana for recreational use, and of the five states voting on recreational marijuana legalisation in November 2016, it passed in California, Nevada, Massachusetts, and Maine. As of September 2016, 25 states and the District of Columbia had legalised medicinal marijuana (ProCon.org, 2016b), and 16 states have specifically legalised cannabidiol (ProCon.org, 2016a), which is a nonpsychoactive marijuana extract. Outside of the United States,

marijuana legalisation is also taking place in countries such as Canada, the Netherlands, and Uruguay.

Edible marijuana products (edibles) contain marijuana or marijuana extract and come in solid forms such as baked goods, candies, gummies, chocolates, lozenges, and liquid forms (such as coffee pods, colas, and teas). In 2014, which was the first year of recreational sales in Colorado, marijuana retail outlets sold 2.85 million units of edibles in addition to the 1.96 million units of medicinal edible products sold at medical marijuana dispensaries (Brohl, Kammerzell, & Koski, 2015). These products accounted for nearly half of total marijuana sales in the state. In Washington, over 570,000 units of edibles were sold in fiscal year 2016 to date, which represents approximately 40% of marijuana sales in the state (Washington State Liquor and Cannabis Board, 2016). Thus, edibles have become highly popular among marijuana retail outlets in Colorado and Washington.

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With their increasing popularity, there are areas of concern associated with edibles that are not associated with other methods of using marijuana, such as smoking or vaping. These concerns include delayed activation time; accidental ingestion, particularly by children and the elderly; and the amount of tetrahydrocannabinol (THC) per serving size. When marijuana is used in the form of edibles rather than smoking, the activation time of the drug is significantly longer and depends on factors such as weight, metabolism, gender, and eating habits, which often causes individuals to consume more edibles than intended because they do not feel an immediate effect. This overconsumption often causes an unexpected or longer-lasting high (Barrus et al., 2016; Grotenhermen, 2003; Huestis, 2007).

Accidental ingestion of edibles, particularly by children and the elderly, is also a concern. Edible products often resemble commercial food products such as candy, cookies, and brownies, which can cause children and adults to unknowingly consume the products. Wang et al. (2016) found that the mean rate of marijuana-related visits to the Children's Hospital in Aurora, Colorado, increased from 1.2 per 100,000 2 years before legalisation to 2.3 per 100,000 2 years after legalisation, and of the marijuana products involved in the exposure, 48% were edibles. Furthermore, this study found that annual Regional Poison Center pediatric marijuana cases increased more than fivefold from 2009 to 2015, and edibles were responsible for 52% of the exposures.

Dose titration, the amount of THC required to achieve the desired effect, is also a concern with edibles because dosage estimation for retail products may be inexact (Barrus et al., 2016; Vandrey et al., 2015). The concentration of THC within a product may not be consistent throughout the edible. For example, in one study of medicinal marijuana, patients reported that they did not feel any effects after having eaten the suggested serving size; therefore, they consumed the entire edible product (Hudak, Severn, & Nordstrom, 2015).

The regulatory agencies of Colorado and Washington have implemented specific labelling requirements for edibles sold for recreational use that help address these concerns. Individual states are in charge of regulation; therefore, labelling requirements vary by state. In Colorado, the Department of Revenue Marijuana Enforcement Division regulates marijuana. The division is responsible for administering and enforcing medical and retail marijuana laws and regulation, including approval and issuance of licenses for marijuana facilities. In Washington, the Washington State Liquor and Cannabis Board is responsible for licensing establishments selling alcohol or marijuana and for enforcing and educating the state's alcohol, tobacco, and cannabis laws.

To our knowledge, research has not been conducted with consumers to assess their use and understanding of the required labelling information for edibles; thus, it is not known how useful these labels are to consumers. The purpose of this study was to conduct focus groups with adults in Denver, Colorado, and Seattle, Washington, to (1) characterise their use and understanding of current labelling requirements for edibles and (2) identify suggested revisions to help ensure safe consumption of edibles.

Methods

Focus groups are a useful approach for evaluating programmes and policies, such as product warning labels. Focus groups can answer such questions as what works well and what does not work well and identify improvements (Krueger & Casey, 2015). Focus groups have been used to assess consumer reactions to genetically modified food labels (Teisl et al., 2002), nutritional information on food products (Lando & Labiner-Wolfe, 2007), and front-of-pack

calories labelling on food products (van Kleef, van Trijp, Paeps, & Fernández-Celemín, 2008).

In February 2016, we conducted 12 focus groups in Denver, Colorado, and Seattle, Washington (6 groups per location), where the sale and use of recreational edible marijuana products are legal. To provide a better understanding of how different groups respond to the labelling of edibles, we segmented the groups by subpopulation to reflect the extent of use of edibles: (1) users, (2) experimenters, and (3) nonusers. In each location, we conducted two groups with each subpopulation.

Eligibility and recruitment

For all three subpopulations, participants had to meet the following inclusion criteria: (1) be age 21 or older; (2) have not been employed (including immediate family members) by a medical marijuana dispensary; a recreational marijuana retail store; a marijuana manufacturing or cultivation facility; a marketing, advertising, or public relations agency or department; the Colorado Department of Revenue; the Colorado Governor's Office; the Colorado Department of Public Health and Environment; the Washington State's Office of the Governor; the Washington State Department of Health; or a state or local law enforcement agency or department in the past 5 years; and (3) have not participated in a focus group in the past 6 months. Each subpopulation had to meet additional inclusion criteria as summarised below.

For the users subpopulation, participants must have consumed solid or liquid edibles during the past 2 months. For this study, experimenters were defined as individuals who prefer edibles to other forms of marijuana use (e.g., smoking). Thus, for the experimenters subpopulation, participants must have (1) consumed solid or liquid edibles in the past 6 months and (2) answered a 4 or 5 (on a scale of 1–5, where 1 was strongly disagree and 5 was strongly agree) to at least one of the following statements: (a) "When I want to get high, I prefer to eat something made with marijuana like brownies or candy instead of smoking it" or (b) "When I buy marijuana, I usually buy food products made with marijuana instead of plain weed." We were particularly interested in the opinions of parents, so for the nonusers subpopulation, participants had to have at least one child (aged 2–17 years) living in their household and (1) either had never used any form of marijuana or (2) had not used marijuana within the past 5 years.

Using convenience sampling, a local market research company recruited participants from their databases who met the requirements for inclusion.

Procedures

The focus groups were held in a room specifically designed for conducting focus groups at a local market research company in each location. Using a structured moderator guide, a moderator led participants in an open discussion about their use (or nonuse) of edible marijuana products. We were particularly interested in participants' reactions to and use of general product labelling and specific labelling requirements for their state of residence. Table 1 presents Colorado's and Washington's labelling requirements for edible marijuana (as of January 2016).

As suggested by Doak, Doak, and Root (1996), we asked participants about the usefulness, attractiveness, ease of comprehension, relevancy, and acceptability of the label information. Participants discussed the features of the label that they liked and disliked and provided suggestions for improving the labelling information. All topics in the moderator guide were addressed in each group. At the conclusion of 9 of the 12 groups, we provided

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