



Full length article

Media portrayal of prenatal and postpartum marijuana use in an era of scientific uncertainty

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ABSTRACT

Background: Objectives were to characterize how scientific information about prenatal and postpartum marijuana use was presented in online media content, and to assess how media portrayed risks and benefits of such marijuana use.

Methods: We analyzed online media items ($n = 316$) from March 2015 to January 2017. A codebook was developed to measure media content in 4 domains: scientific studies, information about health and well-being, mode of ingestion, and portrayal of risks and benefits. Content analysis was performed by two authors, with high inter-rater reliability (mean $\kappa = 0.82$). Descriptive statistics were used to characterize content, and regression analyses were used to test for predictors of media portrayal of the risk-benefit ratio of prenatal and postpartum marijuana use.

Results: 51% of the media items mentioned health risks of prenatal and postpartum marijuana use. Nearly one-third (28%) mentioned marijuana use for treatment of nausea and vomiting in pregnancy. Most media items mentioned a specific research study. More than half of media (59%) portrayed prenatal or postpartum marijuana risks > benefits, 10% portrayed benefits > risks, and the remainder were neutral. While mention of a scientific study was not predictive of the portrayal of the risk-benefit ratio of marijuana use in pregnancy or postpartum, discussion of health risks and health benefits predicted portrayals of the risk-benefit ratio.

Conclusions: Online media content about prenatal and postpartum marijuana use presented health risks consistent with evidence, and discussed a health benefit of marijuana use for nausea and vomiting in pregnancy. Portrayal of risks and benefits was somewhat equivocal, consistent with current scientific debate.

1. Introduction

Marijuana is a commonly used substance during pregnancy (Kuczkowski, 2007; Volkow et al., 2017). Data from the National Survey on Drug Use and Health (NSDUH) indicate that past-month marijuana use as reported by U.S. pregnant women increased from 2.4% in 2002 to 3.9% in 2014; this upward trend closely follows the trend among non-pregnant women of reproductive age (Brown et al., 2016). Currently, 30 states have laws permitting marijuana for medical use; of those states, nine also have laws permitting marijuana for recreational use (including the District of Columbia). State implementation of medical or recreational marijuana laws vary in terms of restrictions on access for medical or recreational use, and in terms of

permitting commercial markets for recreational use. It is unclear whether there is a causal relationship between changing state marijuana laws and the increasing trend of marijuana use among women (Pacula et al., 2015a). Recent observational research suggests that increasing marijuana use among adults is a population trend that is not attributable to state laws loosening legal restrictions on marijuana (Kerr et al., 2017). Other research has suggested that state medical marijuana laws are associated with increased use among adults (Cerda et al., 2012), and that specific provisions of medical marijuana laws, such as protections for medical marijuana dispensaries, are associated with increased use and dependence among youth (Pacula et al., 2015b).

Uncertainty remains about the true risks of marijuana use in and around the time of pregnancy (National Academy of Medicine

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Committee on the Health Effects of Marijuana, 2017). Recent literature reviews have reached conflicting conclusions about whether prenatal or postpartum marijuana use is causally associated with adverse maternal and child outcomes (Conner et al., 2016; Gunn et al., 2016; Jaques et al., 2014; Metz and Stickrath, 2015). Based on research suggesting that marijuana exposure may increase fetal growth risks (El Marroun et al., 2009; Metz and Stickrath, 2015; National Academy of Medicine Committee on the Health Effects of Marijuana, 2017) or neurobehavioral risks (Day et al., 1994; Fried, 1995; Fried and Smith, 2001; Goldschmidt et al., 2004), the American College of Obstetricians and Gynecologists (American College of Obstetricians and Gynecologists Committee on Obstetric Practice, 2015) and the American Academy of Pediatrics (Behnke and Smith, 2013) recommend that pregnant women not use marijuana.

This current scientific uncertainty about health risks of marijuana use in pregnancy has implications for prenatal care. Among women who disclose marijuana use to their prenatal care provider, nearly half receive no counseling pertaining to marijuana use in pregnancy (Holland et al., 2016). As such, women who use marijuana during pregnancy report a lack of useful information about the effects of marijuana on pregnancy and birth outcomes and report searching online for such information (Jarlenski et al., 2016a).

There has been no prior research investigating the content of online media focusing on prenatal and postpartum marijuana use. Media may play an important role in informing women about marijuana use in pregnancy, particularly since women may not self-disclose such use to their healthcare providers. Therefore, we conducted a systematic content analysis of online media items identified using the Google Alerts function between 2015 and 2017. The objectives of our study were to characterize how scientific information was presented in media content, to assess how media portrayed the risks and benefits of prenatal and postpartum marijuana use, and to examine predictors of media portrayals of the risks or benefits of prenatal and postpartum marijuana use. Specifically, we expected that traditional, mainstream news media would be more likely to portray health risks of prenatal and postpartum marijuana use, relative to non-mainstream media. We also expected that media items' characterization of the science around marijuana use would be predictive of their portrayal of the risk-benefit ratio of prenatal and postpartum marijuana use.

2. Material and methods

2.1. Data

Data included online media content collected from March 2015 to January 2017. While the news media play an important role in influencing public knowledge and behaviors around marijuana use (Beaudoin and Hong, 2012; Stryker, 2003), analyses restricted solely to traditional news media content are limited in the interactive media environment that now exists (Freeman and Chapman, 2009; Randolph and Viswanath, 2004). Because we were interested in studying content to which pregnant or postpartum women are exposed via online searching, we used the Google Alerts function to simulate the experience of an individual searching for information online. Google Alerts produces links to online media content including news media, blogs, or informational content; such as websites focused on health information or marijuana legalization, or press releases. We created alerts for English-language content using the keywords: “marijuana” or “cannabis” and “pregnancy” or “prenatal” or “perinatal.” The alert messages in Google Alerts are created using keywords and are based on Google's search function. This study time period encompassed two years in which 12 state policy changes related to medical or recreational marijuana use were considered or adopted.

Each Google Alert message, sent daily, contains the titles of online content as well as a link to the content on the relevant website. We created a summary file that included, for each alert, a unique

identification number, date, estimated word count, and whether the item was published in a mainstream news organization or non-mainstream media outlet. To define mainstream news media, we included any news organization that had at least one journalist credentialed by the U.S. Senate Press Gallery (U.S. Government Publishing Office, 2016). Mainstream news media organizations also included “broad interest” websites that focus on generating original news stories for general audiences (Pew Research Center, 2015), as opposed to “niche” publications catering to specific professions or websites that aggregate industry press releases. Non-mainstream media included websites that focused on specific industries or aggregated press releases, those that focused on lifestyle content (e.g., *Health.com*), websites that focused on marijuana-related information (e.g., *The Cannabist*), and personal or organizational blogs. We classified each media item into 1 of 4 mutually exclusive categories of content: health news, advice/lifestyle content, election or ballot initiative news, or crime news.

There was a total of 388 unique Google Alerts in our study time period. We excluded 72 items that did not focus on prenatal or postpartum marijuana use, defined as those items that did not mention pregnancy or the postpartum period in the headline or first five paragraphs of text. The final analytic sample included 316 items. As shown in the Appendix Table A1, there were 233 media outlets represented in our sample; the modal number of media items in each news outlet was 1 (median: 1, range: 1–5). Because this is a study of media content, and not of living individuals, it does not constitute human subjects research, and IRB approval was not needed.

2.2. Coding instrument development

We used summative content analysis methods to develop a coding instrument to analyze the content of the online media items, in which we drafted a codebook based on *a priori* expectations of media content (Hsieh and Shannon, 2005). We developed a 14-item coding instrument that included codes related to 4 domains concerning marijuana use in and around the time of pregnancy: scientific studies about marijuana use, information about health and well-being related to marijuana use, mode of ingestion of marijuana use, and overall portrayal of the risks and benefits of prenatal and postpartum marijuana use. First, because we were interested in measuring portrayal of scientific studies in online media, we measured whether media items mentioned science or research generally or in passing (e.g., “studies show”). Additionally, we measured whether they mentioned a peer-reviewed study and provided enough information to locate that study, or whether they mentioned a report published by a government public health agency and provided enough information to locate the report. Second, we assessed whether media items specifically mentioned two health risks that have fairly consistent evidence of an association with marijuana use in pregnancy in peer-reviewed research: fetal growth risks (El Marroun et al., 2009; Metz and Stickrath, 2015; National Academy of Medicine Committee on the Health Effects of Marijuana, 2017) or neurobehavioral risks (Behnke and Smith, 2013; Day et al., 1994; Fried, 1995; Fried and Smith, 2001; Goldschmidt et al., 2004). We also measured whether media items mentioned any positive health effect of prenatal or postpartum marijuana use. We measured whether media items mentioned legal implications specific to prenatal or postpartum use (e.g., child welfare agency involvement); Jarlenski et al., 2017; Wang et al., 2016). Additionally, we measured whether media items mentioned that women should stop marijuana use in pregnancy; and whether they mentioned child safety related to marijuana use postpartum (e.g., unintentional ingestion among infants or toddlers). Third, we assessed whether media items mentioned any mode of ingestion of marijuana: combustible inhalation (i.e., smoking), non-combustible inhalation (i.e., using a vaporizer), edible consumption, or transdermal products (i.e., creams, oils, or gels). Fourth, we assessed whether each media item portrayed that the risks outweighed the benefits of prenatal and postpartum marijuana use, the benefits outweighed the risks of prenatal

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