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Young adults' attitudes towards vaping content on Instagram: Qualitative interviews utilizing the associative imagery technique

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ABSTRACT

Backgound: Vaping among young adults (18-24), increased 46% from 2017-2018, resulting in adverse health effects and vulnerability to nicotine dependence. Young adults spend three hours per day using social media, particularly Instagram, which is dominated by pro-vaping messages. Therefore, young adults' exposure to vaping content can result in positive perceptions of vaping. **Aim**: Using the associative imagery technique, our goal was to understand the favorability of Instagram posts depicting aspects of vaping and how young adults relate to the images. **Method**: Semi-structured interviews were conducted with 24 young adults using the analytic induction method. **Results**: Three main themes emerged: 1) the power of color and visual aesthetics, meaning participants were drawn to colorful imagery; 2) distancing, when participants attempted to separate themselves from vaping culture; and 3) the environment influences perceptions, meaning participants paid attention to popular content, which enhanced its perceived credibility. **Discussion**: The type of social media platform and users' expectations are just as important as the vaping content. Attitudes of social vapers compared to hardcore vapers may indicate specific aspects of content perceived as appealing. **Conclusions**: Visually appealing vaping content impacts young adults, but they are hesitant to share content as to be labeled as a "vaper."

KEYWORDS

E-cigarette, qualitative, photo-elicitation, social media, vaping

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Introduction

Vaping, the act of inhaling and exhaling an aerosol, often produced by an e-cigarette or vape pen (Drugfree.org, 2021) is now the most popular method of tobacco consumption for young adults (YA) aged 18-24 (US Department of Health and Human Services, 2016). Vaping increased 46% from 2017 to 2018 among YA (Dai & Leventhal, 2019) and there are indications that it may adversely affect both short-term and long-term health (Floyd et al., 2019). Exposure to nicotine at such an early age puts YA at risk for addiction as well as numerous unknown health risks from long-term vaping (Graham et al., 2020). YA have relatively easy access to vaping products, even though age restrictions are in place (Cwalina et al., 2020). Despite numerous risk and health communication campaigns, such as the Truth campaign equating vaping to animal experimentation, and the FDA's The Real Cost campaign in which e-cigarettes are portrayed as parasites to demonstrate the effects of nicotine (Kreslake et al., 2021), YA are most influenced with regards to vaping by their peers (Jayakumar et al., 2020; Martinasek et al., 2021). YA spend about three hours per day using social media (Bayindir & Kavanagh, 2018) and as a consequence, social media exposes YA to vaping-related content, which can educate YA about vaping products, normalize vaping, and eventually, encourage experimentation with vaping (Alpert et al., 2019). In 2019, the World Health Organization estimated that 35 million people around the world used vaping-related products (World Health Organization, 2019). By 2023, sales of vaping products are projected to reach $40 billion (World Health Organization, 2019). Generally, social media is dominated by pro-vaping messages (McCausland et al., 2019). This is significant because almost half of college students surveyed in a national cross-sectional study viewed vaping content on social media (Sawdey et al., 2017) and they considered personal experience from other vapers appearing on social media as a credible source of information (Dobbs et al., 2020).

One of the most popular social media platforms is Instagram. The U.S. has the most Instagram users worldwide, with more than 140 million (Tankovska, 2021), and 67 percent of all U.S. adults aged between 18 and 29 use the application (Perrin & Anderson, 2019). The photo-based application allows users to easily scroll through hundreds or thousands of images every day (Chen, 2018). Prior studies have identified the most popular aspects of vaping content appearing on Instagram. The predominant type of vaping content on Instagram is vaping devices, photographs of e-liquids, and images of people vaping (Alpert et al., 2021; Ketonen & Malik, 2020; Laestadius et al., 2019). Additionally, most images support vaping and depict it positively, rather than issuing warnings (Alpert et al., 2021; Gao et al., 2020). YA being exposed to vaping content on social media, such as Instagram, resulted in perceived benefits, such as social enhancement and beliefs that vaping would result in experiencing good tastes and smells (Pokhrel et al., 2018). As well as being a form of entertainment, Instagram is also a valuable social medium for YA because it motivates them to establish and maintain social relationships (Lee et al., 2015). An experiment that showed YA Instagram posts and monitored brain activity using MRIs, posts with a high number of "likes" elicited neural activation, meaning it excited the brain (Sherman et al., 2018).

Social influence theory is relevant to Instagram use because it explains the effects that others have on our attitudes and behaviors (Berkman, 2000). The theory focuses on the factors that change users' perceptions about the uses of a particular medium (Walther, 2011). In the social

media environment, social pressure can cause individuals to conform to the behaviors of others as a result of exposure to their online behaviors, otherwise known as herd behavior (Lee & Hong, 2016). Perceived herd behavior is the tendency to mimic the actions of a larger group, regardless of whether the actions are rational or irrational (Lee & Hong, 2016). Followers accept influence from those they follow to the extent that they perceive them to be popular, credible, and relatable (Kim & Kim, 2020; Sokolova & Kefi, 2020). Research indicates that social influence is a strong predictor of YA intentions to try vaping (Pokhrel et al., 2018; Pokhrel et al., 2014). However, YA usage of social media varies. Active users experience greater feelings of bonding using social media (Burke et al., 2010) and higher levels of daily online social connectedness to friends than passive users (Asgeirsdottir et al., 2010). Passive social media use elevates risk factors for detrimental influences, such as social comparison (Nisar et al., 2019). Overall, social media usage and the behaviors of YA are intricate. Depending on the context, studies involving social media found that content can be inspirational and contribute to positive health behaviors (Vaterlaus et al., 2015), while another indicated that Instagram reduced well-being and lowered self-esteem (Faelens et al., 2021).

In a prior study, we analyzed vaping content on Instagram and identified the most liked posts. Popular with at least 1,000 likes included visually appealing, colorful photographs of vaping devices, photos of YA vaping, and e-liquid flavors (Alpert et al., 2021). Based on these categories, our goal was to determine how such content may influence attitudes, perceptions, and intended behaviors towards vaping. The following research questions were proposed:

> RQ1: What are the attributes of vaping-related Instagram images that affect favorability?
> RQ2: How do participants relate to popular vaping images?
> RQ3: How do users report responding to and engaging with vaping-related content on Instagram?

Methods

Participants

To qualitatively assess the perceptions and attitudes of YA about Instagram posts, we focused on undergraduate students at a large university in the southeastern United States. The eligibility criteria were that respondents had to be 1) 18-24 years old, 2) a current vaper or have previous experiences of vaping, and 3) available for an interview via videoconference. An overview of the study was written by the research team and distributed to nine instructors within the university who taught undergraduate courses. They were asked to share the announcement with their class, which included a link to a screening survey. If a potential participant met the eligibility criteria, they chose an available time slot and were sent a link to a Zoom videoconference.

Procedure

The associative imagery technique, a type of photo-elicitation, was used. This involves showing participants specific images to provoke insights, emotions, and beliefs about the images shown (Gong et al., 2012). The use of photos to trigger participants has effectively been used in studies involving YA and adolescent participants (Bessell et al., 2007). Based on

the most popular Instagram categories identified in a previous study (Alpert et al., 2021), representative posts were selected from the following categories: device characteristics, presence of humans, flavors, and warning labels present. The posts were aggregated into a file and shared with participants during interviews. Next, a semi-structured interview guide was developed to incorporate social influence theory and probed why certain images were preferred or not preferred. The guide was written with flexibility, so additional follow-up questions could be asked based on individual responses (Fylan, 2005). Consistent with the associative imagery technique, select Instagram images were shown to participants, followed by questions about each image. Two members of the research team individually conducted all of the interviews (JA, AB) after a brief training period in which JA and AB rehearsed the interview with one another, and then made refinements. Informed consent was reviewed before each interview and all interviews were recorded and later transcribed. All eligible participants who completed the interview received a gift card as compensation. This study was approved by the University of Florida Institutional Review Board (202002152), and all methods were performed in accordance with the relevant guidelines and regulations.

Analysis

Analytic induction method (Taylor et al., 1996) was used to analyze data. First, the entire research team read through all the transcripts to obtain a general sense of the whole. Then, three members of the research team (AB, HR, XC) carefully examined transcripts independently line by line, looking for repeated, similar terms, and grouped comments based on the closeness of meanings, which contributed to the generation of initial coding categories. Using the identified codes, the entire research team met to discuss and share codes towards the creation of a comprehensive codebook. Using the codebook, transcripts were re-read and reviewed to identify emerging insights (Srivastava & Hopwood, 2009). Next, the research team re-read all of the transcripts and paid close attention to relationships among the categories, and developed potential themes. Preliminary themes were discussed and scrutinized by the research team until consensus was reached. The reliability of the analysis was confirmed through the research team's reflexive process of continuous self-examination toward our attitudes and reactions to the data when constructing themes (Dodgson, 2019), as well as portraying the behaviors and context of participants in detail, otherwise known as thick description.

Results

Demographics

A total of 24 participants enrolled in the study. Most identified as female (71%, n=17), and the mean age was 21 years old (SD=1.46). Only 13% (n=3) of the 24 participants self-identified as vaping very frequently or daily. A larger group, 38% (n=9), vaped socially, particularly when drinking, and 20% (n=5) identified as rarely vaping. At the time of the interview, one (4%) participant was trying to quit, and 25% (n=6) had already discontinued the act of vaping. Notably, 42% of participants (n=10) had not vaped in six months or more at the time of the interview, while 38% (n=9) reported last vaping within one week of the interview, in late 2020.

The majority (71%, n=17) did not express an intention to discontinue vaping at any point in the foreseeable future.

Social Media Usage

Most participants (79%, n=19) identified as heavy social media users, defined as using more than four social media platforms. The most common social media used were Instagram (96%, n=23), Snapchat (88%, n = 21), Facebook (63%, n = 15), and Twitter (63% n =15).

Themes

During interviews, we referred to "vaping" as a catch-all phrase that encompassed first-generation devices (ie, "cigalikes"), second-generation devices (ie, "vape pens"), and third-generation devices (ie, "mods" or "box-mods"), as well as pod vape devices, which are characterized by their sleek design and flavor pods which use high-concentration salted nicotine formulations and emit very high levels of nicotine at low power output (Fadus et al., 2019). Any electronic nicotine delivery systems described by participants will be referred to as "vaping" in the following section. Three overarching themes were revealed in our analysis, including 1) the power of color and visual aesthetics, 2) distancing, and 3) the environment influences perceptions.

The power of color and visual aesthetics

Design aesthetics, such as colors and vibrancy of images, professional quality of photographs, and the inclusion of eye-catching visual subjects were the main determinants of favorability. When shown a selection of images, each representing a different category (Figure 1), six participants (25%) selected #5 as their favorite, and another six participants (25%) selected #6. Both posts prominently featured colorful devices. Participant #11 explained what drew her to image #6:

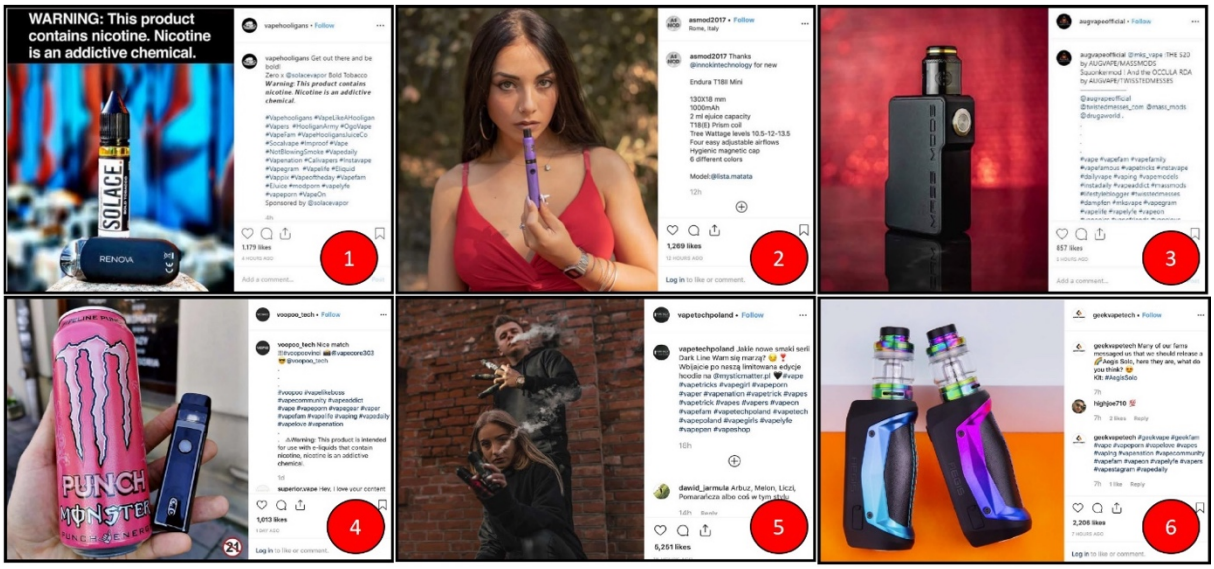
> I just find the colors to be really pretty. So that's what struck me the most.

Another participant focused on how image #6 stood apart from others:

> I really like the colors of this one, like the rainbow definitely would make me stare at it for a little bit longer than other posts.

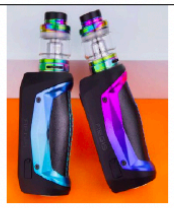
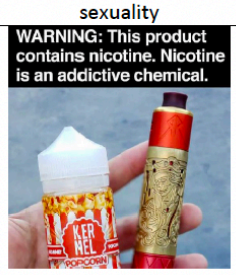
Image #5 included two individuals posing with devices between their fingers. The professionalism of the photograph is what differentiated it from others. It was described as "cool" and "inspirational."

Figure 1. Posts presented for participant preference



After participants chose their preferred post from the initial set of images, they selected their favorite from a selection of images within the same category, such as posts of devices, women, other people, and flavors (Figure 2). One set of images featured women making suggestive sexual innuendos. Four of the seven males reported the attractiveness of the models in the image to be influential. Female participants acknowledged the attractiveness of the models but also noticed visual elements of the photos. For instance, participants compared the lighting used in each photo and speculated whether the photo was shot by a professional, while others were intrigued by the models' tattoos. Among posts featuring people, participants appreciated the professionalism of the photo compared to its alternative of a woman using a photograph filter. Filters from Snapchat and Instagram were looked down upon as appearing "tacky" and not unique because "everyone uses them." Regarding flavors, an image of popcorn e-liquid was preferred because participants were "intrigued" by the packaging visual. Interestingly, few participants disliked the large warning label that appeared with the popcorn image.

Figure 2. Frequency of most preferred images among YAs

Image Group	Image	Number of YA who preferred the image
Devices	 Instagram post featuring colorful vaping devices	n=9
People	 Instagram post inclusive of people using devices	n=13
Sexuality	 Instagram post showcasing sexuality	n=14
Flavors	 Instagram post promoting flavors with a safety warning	n=15

Distancing

The second theme, "distancing," indicates how participants sought to separate themselves from the culture of vaping. Posts shared with participants contained hashtags like "#vapelife," which is considered to be a community of vapers who share tips, tricks, and promote the inclusion of vaping in daily life. Participants often indicated that others might find posts representing the culture of vaping interesting or persuasive, but not themselves. There was hesitancy to like, share or repost this type of content because of the negative stigma associated with vaping. Participants were afraid relatives or other individuals on their social network might discover that they vape and instead, wished to keep this activity private. Participant #2 said:

> I don't want to be known for that and like, with social media, whatever you post, people will keep tabs.

If participants were to share or repost content, they would do so privately by tagging or private messaging a specific friend who may be interested in the vaping-related post. Other

participants described wanting to keep their Instagram accounts "more professional" or appropriate for parents and grandparents.

A clear distinction was also made between themselves, self-defined as "social" vapers with "hardcore" vapers who were perceived to be much more interested in the vaping lifestyle. Heavy vapers were described as those who would be more likely to respond positively to the images flaunting vaping. Participant #12 summarized the idea of distancing oneself from vaping culture by referring to image #5 (Figure 1):

> They're just flexing/vaping too much…It's just like it looks like a lifestyle for them and I wouldn't want [that to be] my lifestyle.

The same participant explained that she uses disposable devices because if she were to purchase mods, such as the ones featured in posts, vaping would then become more of a lifestyle. Likewise, participant #20 explained this distinction of "us versus them," or hardcore versus social vapers:

> [Vapes] do kind of have a negative connotation now. Like it's especially the ones that are bigger, like the mods with the giant bases…are kind of out of style…most of my friends use disposable ones…the big ones are known as like very hardcore vapor vibes like the people that want the biggest clouds...

After viewing a post with a female posing sexually, a participant commented that they did not like that the vape juice was positioned adjacent to the model's morning coffee. The implication was that vaping was part of the model's morning ritual. The participant pointed out how unhealthy this seemed and elaborated about how they perceived their vaping behavior differently. Similarly, distancing also occurred by participants considering the health implications of vaping. Among participants who reported quitting, the reason was due to the detrimental health effects that they now realize are associated with vaping; something they did not take seriously in high school. Participant #18 elaborated on how her vaping behavior went from social practice to dependence, and how her recognition of this led to quitting:

> I realized that the creation of them was to stop people from smoking cigarettes. And I realized I didn't even smoke cigarettes and I was making myself addicted to something that was supposed to solve something else.

The environment influences perceptions

The third theme focuses on how there are certain norms associated with using Instagram. These norms play a role in how content is viewed and the meaning it represents. Participants reported that while they often did not seek vaping content by utilizing vaping-related hashtags or following vaping influencers, they did encounter vaping content within their feed. Multiple participants paid attention to content that had more likes, as hundreds or thousands of "likes" on Instagram were seen to lend perceived credibility and validity to a post.

Despite Instagram being the most frequently used social media platform among participants in the study, vaping-related content on Instagram was perceived as less engaging when compared to other social media platforms. Specifically, content on both TikTok and YouTube were considered as more appealing platforms. As participant #2 explained, "They (TikTok, YouTube) definitely understand the consumer more." Whereas Instagram content was described to be the most prevalent place to see vaping-related images, another participant stated that it was hard to find engaging content on Instagram because posts, such as what was shown during the interview, "automatically kind of look posed."

However, an aspect of Instagram posts that stood out to participants was warning labels. Examples included big, bold, declarative labels about the harm and risk that comes from vaping (#1, Figure 1) to small and discreet disclosures asserting that the product was for ages 21 and older (#4, Figure 1). Participants seemed to prefer smaller warnings (#4) over large warning labels. The larger label immediately indicated to participants that they were viewing an advertisement. As participants preferred organic content on Instagram to paid advertisements, the inclusion of large, "obnoxious" labels would lead many to scroll past and ignore the message entirely. Overall, participants had conflicting feelings about warning labels. Some participants experienced conflicting emotions, such as participant #18 who stated:

> I definitely know nicotine is like really bad for you. Like I said, I might do it in social events or… I don't do it on a daily basis. So, the warning labels. I definitely think that it's important because I'm like, oh, this is bad for you.

Nine participants (38%) acknowledged the value of warning labels and praised the brands for their transparency. Participant #24 stated that the inclusion of warning labels displayed a brand's authenticity, which could build trust among consumers, even if the warning labels may not deter anyone's vaping behavior. Other participants expressed wanting to quit vaping and how a warning label could be a timely reminder to stop a harmful habit:

> I actually appreciate the warning label because I feel like that's not very common… I think a lot of people don't really take into consideration what something does to your body when they decide to buy it or do it.

Discussion

The current study assessed young adults' (YA) receptivity, engagement, and preference of vaping-related content on Instagram. Findings indicate that YA prefer visually aesthetic Instagram vaping posts. However, different aesthetic elements such as colors, vibrancy, professional quality of photographs, models, and vaping devices shape YA favorability of vaping posts to different degrees and in various ways. For example, while most of the participants indicated their preference for colorful and vibrant posts, those participants' opinions were divided on the posts that portrayed attractive models and the posts with only devices. Alpert et al. (2021) found that among vaping-related Instagram posts, 84% featured a vaping device as the focal point, and the style of the device was often matte (75%) in only one or two main colors (55%). The current study revealed that the most popular post was an image of a device, however, the device was colorful and shiny.

Our findings also suggest that YA perceptions of vaping posts on Instagram are complex and multi-layered, reflecting their negotiations of in-group and out-group identities, shaped by the cultures of both Instagram and vaping. Most participants of the current study identified themselves as social vapers, different than hardcore vapers who vape frequently and are obsessed with vaping tricks. While these social vapers are members of the vaping community and participate in various activities within the community, they try to distance themselves from the culture and don't want to acknowledge that they are or might be part of the culture. This may be due to the changes in socially constructed meanings of vaping (Colditz et al., 2017). In the early part of the 2000s, vaping was considered much less harmful than traditional cigarettes (McAuley et al., 2012). That notion combined with appealing flavors and alluring scents made vaping a socially acceptable trend that was perceived as "cool." Recent studies

have demonstrated that vaping may be as harmful as traditional tobacco (Tobore, 2019). Thus, YA who once wanted to be a part of the "cool" culture are now attempting to disassociate themselves from the act of vaping and its community.

Consistent with our theme of "distancing," the third-person effect (Davison, 1983) explains this behavior. The third-person effect predicts that people tend to perceive that mass media messages have a greater effect on others than on themselves. Our study found that participants who consider themselves as light or social users believed that the social media vaping content would not influence them, but could affect others, like hardcore vapers. Other studies utilizing the third-person effect found that individuals perceived themselves to be less vulnerable than others to the impact of COVID-19 digital disinformation (Liu & Huang, 2020). Another way participants dissociated themselves from vaping culture in the current study was to intentionally not interact with vaping posts through liking, reposting, or commenting. The reason for this inaction was because they did not want certain connections to learn that they vape.

We also found that the choice of social media platform is meaningful to the type of content users expect to see and how they choose to interact with it. While vaping posts on Instagram may be more attractive to YA given to its visual oriented culture (Chen, 2018), vaping posts on Instagram were perceived as less engaging than vaping posts on video-oriented platforms such as Snapchat or TikTok due to their dynamic nature, which is more appealing to a younger audience (Massey et al., 2021). YA construct different meanings for different social media platforms. Hence, interventional campaigns may consider including multiple platforms and tailoring messages so they are suited for each platform, to achieve communication goals.

Similarly, we found varied responses to the presence of warning labels viewed on Instagram posts. Previous research suggests that warning labels on packaging influence perceptions of risk (Katz et al., 2017). Participants in the current study, however, construed different meanings for warning labels embedded in social media vaping posts. They did not think warning labels would perform any informational or educational role to influence their vaping usage or behavior because they already knew about the negative health effects of vaping. Rather, they deemed warning labels as a way for vaping companies and brands to show their authenticity and transparency to earn vapers' respect and trust. Additionally, warning labels signaled YA knowledge and health literacy of vaping. Although warning labels are not definitively effective in influencing vaping behaviors, they generate a positive connotation toward vaping brands that include warning labels in their social media posts, especially those that use smaller size warning labels.

This study has important implications for agencies and organizations designing social media-driven interventional campaigns to educate YA about vaping. First, regardless of the choice of message strategy, the social media post must have visually aesthetic elements that fixate the attention of YA (Alpert et al., 2019). In particular, vibrant colors are most effective since they elicit YA favorability toward an Instagram vaping post. An online tobacco prevention module found that using fonts that stood out and visuals that gained attention was likely to increase engagement among YA (Lazard et al., 2020). Second, social influence and social norms are important factors for YA to initiate vaping. However, with the change of social and cultural meanings of vaping, as revealed in the current study, YA vapers, especially social vapers are trying to disassociate themselves from the vaping community. Thus, another strategy is to emphasize and reinforce the negative connotation and stigma associated with vaping and

highlight the updated social norm of discontinuing vaping to strengthen social vapers' intention to distance themselves from the vaping community. For instance, a community-engaged risk communication campaign to reduce vaping that focused on health risks increased perceptions of risk and anti-vape intentions (England et al., 2021).

Limitations and Future Research

While the selection of Instagram posts featured in the study was representative of real-world Instagram vaping posts, they were limited in number and scope. The sample was mostly female, all from the same university, and did not include many individuals who are regular vapers, therefore limiting the generality of the findings. Future research may include a more diverse pool of participants as well as social media posts to gauge YA receptivity and engagement. Similarly, the images were not shown in the typical manner in which users view images. The lack of viewing posts in the normal Instagram feed may have altered perceptions. Future research should design an experiment that simulates the Instagram viewing experience. Additionally, social media algorithms strongly influence the content that is shown to individuals. Individuals who interact and "like" vaping-related content may be exposed to it more often than those who do not interact with it as often. Finally, the study only focused on vaping posts appearing on Instagram. Future research should examine vaping posts across numerous social media platforms.

Conclusions

Interviews with young adults were conducted to understand how they process and interpret vaping content appearing on Instagram. We found that visually striking posts are necessary to get users' attention. Most participants vape socially and did not want to be associated with "hardcore vapers," by sharing, liking, and commenting on vaping posts. These findings along with perceptions that warning labels lend credibility and authenticity to vaping brands should be considered when developing interventions to curb vaping among young adults through social media messaging.

Declaration of Interests

None declared.

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QUALITATIVE HEALTH COMMUNICATION

VOLUME 1, ISSUE 2, 2022