As we struggle to identify solutions to a growing epidemic, we need to consider not just those who are injured or killed but also the potential for other children to experience long-term emotional consequences as a result of this subset of violence in our communities. All must be addressed.

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Impact of Policy on Children

Content Analysis of Instagram Posts From 2019 With Cartoon-Based Marketing of e-Cigarette–Associated Products

The use of e-cigarettes is a growing public health concern. In 2019, 27.5% of US high school students reported current e-cigarette use.1 Marketing practices by e-cigarette companies may specifically appeal to adolescents2 and contribute to tobacco use-associated behaviors. Studies have indicated that cartoons are an effective strategy in increasing product recognition and susceptibility to use e-cigarettes.3 Recently, the US Food and Drug Administration announced it is prioritizing enforcement against e-cigarette companies that use marketing likely to promote youth use.4 This study aimed to determine if companies were using cartoon-based strategies to market and promote e-cigarette–associated products in 2019 on Instagram, an image-based social media platform popular among adolescents.

Methods | Prior research suggests the hashtag #ejuice is commonly used in e-cigarette–associated promotional posts on Instagram.2 As such, posts that contained this hashtag were scraped from Instagram between August 22 and September 12, 2019. All posts that remained publicly available at the time of analysis were included. Each Instagram post (image and corresponding caption) was reviewed and coded as to whether it contained (1) a cartoon, (2) promotional content, (3) a cartoon as the company's logo, (4) the name of the company that used cartoons, and (5) Instagram user engagement data (i.e., the number of likes the post received). Rules for coding were based on the Master Settlement Agreement definition of a cartoon (Box) and similar to prior research.2

Table. Cumulative Percentage of Mass Shooting Events by Distance to Schools or Places of Interest (Athletic Fields, Playgrounds, Parks, Recreation Centers, and Zoos)

<table>
<thead>
<tr>
<th>Events</th>
<th>Distance from mass shooting</th>
<th>%, Mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>School</td>
<td>Median, mile On site, %</td>
<td>Up to 0.1</td>
</tr>
<tr>
<td>School</td>
<td>0.4</td>
<td>3.6</td>
</tr>
<tr>
<td>POIs</td>
<td>0.6</td>
<td>6.0</td>
</tr>
<tr>
<td>Overall</td>
<td>0.3</td>
<td>9.6</td>
</tr>
</tbody>
</table>

Abbreviation: POI, place of interest.
Two coders were trained using a subsample of 1000 posts to establish interrater reliability. Agreement ranged from 70% to 90% for the coded categories. Any disagreements were resolved by a third coder (J.P.A.). Descriptive statistics were calculated, including the companies who most frequently used cartoons, and an independent t test was used to determine if Instagram user engagement (mean number of likes) differed between posts with vs without cartoon-associated content.

All posts and analyses relied on publicly available and accessible data from Instagram’s website. Data collection adhered to the terms and conditions, terms of use, and privacy policy of Instagram and was approved by the University of Southern California institution review board. Data analysis was completed with SPSS version 25 (IBM), with the significance threshold set at $P < .05$.

**Results**

A total of 2100 posts were scraped, of which 1936 remained public at the time of analysis. One hundred forty-two of 1936 posts (7.3%) had 1 or more cartoons somewhere in the image, 1608 of 1936 posts (83.1%) were identified as promotions, and 44 of 1936 images (2.3%) were coded as a cartoon solely because of the logo. We identified 100 different companies that used cartoons in promotions (Figure), including Bang Juice ($n = 9$), Jam Monster ($n = 6$), Kenji Juice ($n = 4$), Dr Frost ($n = 3$), Vapetasia ($n = 3$), Nasty Juice ($n = 3$), Momo E-liquid ($n = 3$), and Mr Nilk’s ($n = 3$), among others. Posts with cartoons received more likes (mean [SD], 133.94 [24.34] likes) compared with posts without cartoons (mean [SD], 72.41 [4.12] likes; $P < .001$).

**Discussion**

Companies selling e-cigarettes used cartoons in their marketing and promotional practices on Instagram in 2019. Findings demonstrated that user engagement was higher among posts with cartoons, indicating cartoons’ appeal among users of Instagram. Logos and product packaging are known to have an association with consumers’ attitudes and behaviors, and adolescents are left vulnerable to these industry tactics. While the Master Settlement Agreement restricted the use of cartoons and youth-specific marketing tactics for combustible tobacco cigarette and chew companies, e-cigarette companies are not included in the agreement. The US Food and Drug Administration may take action against these companies, including through warning letters to injunction, seizure, and/or civil money penalty actions where warranted. While the current study could not determine the outcome of these promotional practices on e-cigarette appeal among adolescents, prior research has shown that recognition of cartoon-based imagery increased appeal of e-cigarette–associated products among young adults. Future research should determine how exposure to these marketing strategies affects perceived risks and benefits of e-cigarette use, intentions to use, and use among adolescents.

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**Accepted for Publication:** February 26, 2020.

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**Author Contributions:** Dr Allem and Ms Dormanesh had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.  

**Concept and design:** All authors.
Population health is affected by sociopolitical events, particularly in groups specifically threatened by those events. The 2016 presidential election was associated with a rise in anti-Muslim rhetoric, policy, and hate crimes. Donald Trump called for banning Muslim immigrants. We assessed whether the election was associated with changes in the mental health of Muslim college students, an underresearched population potentially facing mental health inequities. Four whiteboards at all schools, and all participants provided written informed consent.

Methods | Survey data were from a random sample of students 18 years or older from 90 colleges and universities participating in the Healthy Minds Study in the 14 months before or after the election. This survey was approved by institutional review boards at all schools, and all participants provided written informed consent.

We assessed a binary outcome defined by exceeding cut-off scores for clinically significant depression, anxiety, or eating disorders (≥15 on the Patient Health Questionnaire–9 or the Generalized Anxiety Disorder–7 or ≥3 on the Sickness, Control, One, Fat, Food [SCOFF] questionnaire). Key independent variables were the timing of survey completion (after vs on or before November 8, 2016), Muslim identity (students selecting “Muslim” when providing religious affiliation, with multiple selections possible), and religiosity (students who indicated religion as “important” or “very important” vs “somewhat important,” “neutral,” “not important,” or “very unimportant”).

We adjusted for differences between students who responded and those who did not respond using sample probability weights (inverse of response probability) based on institutional data on sex, race/ethnicity, academic level, and grade point average. We tested for changes in the proportion of Muslim students reporting clinically significant mental health symptoms surrounding the election beyond changes experienced by non-Muslim individuals, using a difference-in-difference logistic regression. We also tested for unique associations for Muslim individuals who were religious. We adjusted for school and self-reported student characteristics known to be associated with mental health (Table). These analyses were conducted between November 2019 and June 2020. Analyses used a 2-sided P < .05 as a threshold for statistical significance and were performed in Stata version 15.1 (StataCorp).

Results | The survey response rate was 25%. A total of 75,578 students (56.78% women; 2.24% Muslim) participated. Student and school characteristics are presented for the periods before and after the election for Muslim and non-Muslim participants (Table). Differences between the groups were mostly stable over time. Mental health in Muslim and non-Muslim individuals changed approximately in parallel before the election, with no significant differential change from fall 2015 to spring 2016.

Controlling for changes experienced by non-Muslim participants, the election was associated with a rise of 7.0 (95% CI, 1.0–13.0) percentage points in the proportion of Muslim students experiencing clinically significant mental health symptoms in the 14 months postelection compared with the 14 months prior. Changes from before to after the election were largest for Muslim individuals who were religious, at 10.9 (95% CI, 3.7–18.1) percentage points (vs 8.1 [95% CI, −3.5 to 19.7] percentage points for Muslim individuals who were nonreligious, 3.5 [95% CI, 1.3–5.8] percentage points for non-Muslim individuals who were religious, and 2.8 [95% CI, 1.1–4.6] percentage points for non-Muslim individuals who were nonreligious) (Figure).

Discussion | To our knowledge, this is the first national study of Muslim mental health changes through the 2016 election. Our results indicate the election was associated with declines in mental health among Muslim college students significantly beyond the declines experienced by other students. The largest declines occurred for Muslim individuals who were religious.