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Tobacco-Related Images on Instagram’s Persian-Language Pages and Audience Attraction Rates

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Abstract

Background: Social media can be powerful tools to influence high-risk behaviors. This study aimed to evaluate tobacco-related images on Instagram’s Persian-language pages and their audience attraction rates.

Materials and Methods: This cross-sectional study included 1870 Instagram posts with cigar, cigarette, e-cigarette, tobacco, vape, and shisha/waterpipe/hookah hashtags. The number of likes and comments for these posts were recorded, and the image type, the attitude of the audience, and the type of caption were noted as well.

Results: In general, 500 images (26.7%) had #cigar/cigarette, while 30 (1.6%), 470 (25.1%), 650 (34.8%), 70 (3.7%), and 150 (8%) images had #e-cigarette, #shisha/#waterpipe/#hookah, #tobacco, #juice, and #vape hashtags, respectively. The most common type of image was product images (52.4%). The audience’s attitude towards the images was mostly positive (93.2%). In addition, the most common caption type was sales (76.5%). There was a significant correlation between the number of likes and comments with image hashtags, audience attitude, and caption type. The highest number of likes and comments belonged to images with shisha/waterpipe/hookah hashtags and a positive audience attitude. The sales caption type had the highest number of likes, while the encouragement caption type had the highest number of comments. Eventually, text image types had the highest number of comments.

Conclusion: Given the high promotion of tobacco-related posts on Instagram, policymakers should take the necessary measures to reduce the volume of tobacco advertisements.

Keywords: Instagram, Tobacco, Smoking, Cigarette, Hookah

Introduction

Tablets, smartphones, and mobile apps, currently available to all individuals, can play an important role in healthcare (1, 2). Mobile tools and social networking services such as Instagram have recently become highly popular and can be used to share and discuss health and medical knowledge (3). On the other hand, social media can be powerful tools to promote and influence risky behaviors such as alcohol consumption and smoking (4-6).

Although the presence of tobacco-promoting messages on social media is well documented, research has so far been limited to small or descriptive studies that have examined the characteristics or general direction of tobacco-related correlations on social media (7-10). Depue et al reported that exposure to images of tobacco consumption on social media predicted future smoking in young adults in the age range of 18-24 years (11); in this study, social media had a greater impact on smoking behaviors compared to television shows or movies (11). Despite the potential influence of social media on the health behaviors of the youth, limited studies have documented the overall prevalence of exposure and involvement with tobacco-related media or the impact of social media on youth smoking behaviors.

Using data from the National Youth Tobacco Survey in 2011, researchers found that 11% of 11 to 18-year-olds had received advertisements from tobacco companies via Facebook or MySpace in the past 30 days (12). However, this study focused only on industry-sponsored advertising, which is no longer allowed by many social media policies (13). Social media has also become much more widespread since this study in 2011 (14).

Objectives

Due to the increasing use and great impact of social
networks, especially Instagram, on lifestyle and high-risk behaviors such as smoking, the current study aimed to investigate tobacco-related images on the Persian-language pages of Instagram and their audience attraction rates.

**Materials and Methods**

**Participants**

This cross-sectional study evaluated all Instagram posts with hashtags related to tobacco, including cigars, cigarettes, e-cigarettes, tobacco, vape, and shisha/waterpipe/hookah during February-March 2021. Based on previous research, the time conditions for data collection were determined as one month. Considering that Instagram posts and comments remain on the pages after uploading without any time limit, the research included all the posts of Persian-language pages available on Instagram (5).

Nicotine products were identified through several hashtags on Instagram, and the most used hashtags were listed accordingly. The products that had the number of hashtags on Instagram included #Cigar/cigarette, #E-cigarette, #Shisha/#Waterpipe/#hookah, #tobacco, #juice, and #vape.

#Vape refers to a vaporizer containing nicotine and #juice is a liquid that is made up of four basic ingredients, including water, nicotine, flavorings, and a propylene glycol or vegetable glycerin base (15).

**Coding Of Images Themes**

The purpose of the approach was to condense the raw image-based data into a summary format and report the underlying themes that were evident in the data. The primarily identified themes were four types of images such as personal images, advertisements, products, texts, and other cases. As regards the first and second types, the contents of the photos were based on the presence of a person or a human portrait, as well as advertising tobacco products, respectively. Regarding products and texts, the content was based on the introduction of a specific commercial product and contains only the text, respectively. Finally, the other cases included posts that did not clearly fall into one of the above-mentioned categories (5).

A secondary theme of images, inducing attitudes towards smoking and tobacco use, was identified that was considered positive, negative, or neutral if it induced a positive message about consumption, created a negative message towards the desire, or if did not induce any message, respectively.

Each photo on Instagram can have a related caption. Based on the type of the attached caption, 7 groups were categorized, including sales, treatment, encouragement, health, personal note, other subjects, and no caption. The mentioned categories contained captions about tobacco product selling, the provision of tobacco treatment services, advice on smoking, health advice about the disadvantage of smoking, personal ideas and thoughts, and any content other than the above cases. The last one included an unwritten caption.

The above variables were selected based on previous research, and, a questionnaire was prepared accordingly and separately completed by all three researchers (15).

**Study Design**

Three researchers independently reviewed the posts. Their consensus opinion regarding the classifications and study variables was recorded accordingly. Images were classified into four groups, namely, personal images, advertisements, products, and texts. The number of likes and comments for each image was noted. The audience's attitude towards each image was positive, negative, or neutral. The captions of the posts were evaluated as well. Accordingly, there were either no captions, or they were associated with sales, treatment, encouragement, health, personal notes, or other subjects.

In the social network Instagram, the contacts show their attitude towards each post by liking and disliking. Another way that the contacts on Instagram can participate is to leave comments under each post. In the comment, the audience expresses his meaning in written words, and his attitude can be evaluated more carefully. The audience usually writes about the content of the images or the caption of the comment (15).

**Data Analysis**

The Statistical Package for the Social Sciences (SPSS) software (version 25.0, Armonk, NY, IBM Corp., USA) was used to analyze the data. Frequencies and percentages were employed to describe qualitative variables. One-way analysis of variance (ANOVA) was applied to compare quantitative variables between groups, and P values ≤ 0.05 were considered statistically significant.

**Results**

A total of 1870 Instagram images were included in the study. In general, 500 images (26.7%) had cigar/cigarette hashtags, whereas 30 (1.6%), 470 (25.1%), 650 (34.8%), 70 (3.7%), and 150 (8%) images had e-cigarette, shisha/waterpipe/hookah, tobacco, juice, and vape hashtags, respectively. Table 1 presents the frequency of images by type of image, audience attitude, and type of caption. The most common type of image was product images (52.4%), followed by advertisements (36.3%) and personal images (7.6%). Audience attitudes towards the images were mostly positive (93.2%). Additionally, the most common caption type was sales (76.5%). Overall, the tobacco-related posts received 328.53 ± 646.74 (0-9199) likes and 5.09 ± 16.42 (0-473) comments.

There was a significant correlation between the number of likes and comments with image hashtags...
The highest number of likes and comments was related to images with shisha/waterpipe/hookah hashtags (700 ± 616.65 and 9.53 ± 24.39, respectively; Table 2). The number of likes and comments were also significantly associated with audience attitude, and positive attitudes had the highest number of likes and comments (Table 3). On the other hand, the relationship between the number of likes and type of image was not statistically significant, while the number of comments was significantly correlated with the image type ($P = 0.043$). In addition, text image type and advertisement image type had the highest and lowest number of comments, respectively (Table 4). Moreover, there was a significant relationship between the number of likes and comments and caption type (Table 5). Sales caption type and encouragement caption type had the highest and lowest number of likes and comments, respectively.

**Discussion**

In the current study, it was found that product (52.4%) and advertisement (36.3%) images were the most common types of tobacco-related Instagram posts. Furthermore, captions were mostly associated with tobacco sales (76.5%) rather than treatment, encouragement, health, or personal notes. One of the topics that has received less attention in our country is the prevention of advertising and widespread use of tobacco since most videos show images of cafes or shisha/waterpipe halls and people smoking. There are a very limited number of studies addressing this issue similar to what we did in the current study. However, Allem et al reported only 18% of advertisements and 6% of product images (15), which were considerably lower than our findings. This shows that more surveillance should be performed to reduce the advertising of these deleterious substances in our country.

The evaluation of the likes and comments of tobacco-related Instagram posts demonstrated a significant correlation with hashtags; in other words, posts with

| Variables          | Values No. (%) |
|--------------------|----------------|
| Type of image      |                |
| Personal image     | 142 (7.6)      |
| Advertisement      | 679 (36.3)     |
| Product            | 979 (52.4)     |
| Text               | 68 (3.6)       |
| Audience attitude  |                |
| Positive           | 1743 (93.2)    |
| Negative           | 32 (1.7)       |
| Neutral            | 95 (5.1)       |
| Type of caption    |                |
| Sales              | 1410 (76.5)    |
| Treatment          | 14 (0.7)       |
| Encouragement      | 12 (0.6)       |
| Health             | 9 (0.5)        |
| Personal note      | 75 (4.0)       |
| Other subjects     | 194 (10.4)     |
| No caption         | 116 (7.3)      |

Note: N: Number. *Analyzed by Fisher’s exact test.

$(P = 0.009$ and $P < 0.001$, respectively).

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| Variables          | Likes (Mean ± SD) | Comments (Mean ± SD) |
|--------------------|-------------------|----------------------|
| Hashtags           |                    |                      |
| Cigar/cigarette    | 152.76 ± 416.77    | 4.18 ± 18.14         |
| E-cigarette        | 125.90 ± 235.14    | 4.10 ± 6.52          |
| Shisha/waterpipe/hookah | 700.00 ± 616.65 | 9.53 ± 24.39        |
| Tobacco            | 280.01 ± 798.32    | 3.60 ± 7.91          |
| Juice              | 118.71 ± 98.98     | 2.00 ± 2.75          |
| Vape               | 99.14 ± 213.81     | 2.23 ± 6.16          |
| $P$ value*         | 0.009              | < 0.001              |

Note: ANOVA: Analysis of variance; SD: Standard deviation. *Analyzed by one-way ANOVA test.

| Variables          | Likes (Mean ± SD) | Comments (Mean ± SD) |
|--------------------|-------------------|----------------------|
| Audience attitude  |                    |                      |
| Positive           | 342.92 ± 665.82    | 5.34 ± 16.97         |
| Negative           | 176.31 ± 246.44    | 3.19 ± 3.63          |
| Neutral            | 121.92 ± 97.45     | 1.00 ± 1.46          |
| $P$ value*         | 0.037              | 0.046                |

Note: ANOVA: Analysis of variance; SD: Standard deviation. *Analyzed by one-way ANOVA test.

| Variables          | Likes (Mean ± SD) | Comments (Mean ± SD) |
|--------------------|-------------------|----------------------|
| Type of image      |                    |                      |
| Personal image     | 353.60 ± 525.53    | 8.68 ± 22.30         |
| Advertisement      | 238.13 ± 724.87    | 2.99 ± 6.29          |
| Product            | 388.00 ± 599.52    | 5.51 ± 13.12         |
| Text               | 321.00 ± 615.37    | 12.43 ± 58.61        |
| $P$ value*         | 0.674              | 0.043                |

Note: SD: Standard deviation; ANOVA: Analysis of variance. *Analyzed by one-way ANOVA test.

| Variables          | Likes (Mean ± SD) | Comments (Mean ± SD) |
|--------------------|-------------------|----------------------|
| Caption type       |                    |                      |
| Sales              | 332.84 ± 680.97    | 3.75 ± 7.55          |
| Treatment          | 170.93 ± 141.33    | 4.00 ± 3.46          |
| Encouragement      | 314.25 ± 460.79    | 11.25 ± 15.08        |
| Health             | 104.89 ± 101.70    | 1.89 ± 1.45          |
| Personal note      | 270.52 ± 578.92    | 10.95 ± 33.82        |
| $P$ value*         | 0.016              | 0.021                |

Note: ANOVA: Analysis of variance; SD: Standard deviation. *Analyzed by one-way ANOVA test.
shisha/waterpipe/hookah hashtags had the highest number of likes and comments. Allem et al also found that hookah hashtags were very popular. This is probably because hookah has currently many fans due to the lack of awareness of its harms, as well as its availability in restaurants, cafes, and other entertainment facilities. The international promotion of hookah is also reported to be common on Instagram. Ben Taleb et al showed that Instagram posts promote the normalization of hookah use by associating it with community and nightlife (16).

Another finding of the current study was the significant association between the number of likes and comments and audience attitudes. Based on the results, a significantly higher number of likes and comments was observed on Instagram posts with the positive attitudes of the audience towards tobacco compared to those with negative or neutral attitude. This finding indicates the correlation of contents containing a positive attitude with individuals who are prone to smoking. Similarly, in various studies around the world, a strong and positive association has been reported between the onset of smoking in adolescents and young adults with exposure to the media and films depicting smoking (17). This also increases the need for improving the monitoring of social networks by parents and authorities. On the other hand, it was demonstrated that 93.2% of Instagram posts had a positive audience attitude towards tobacco use. This confirms the effect of this social network on creating a positive attitude in adolescents and young adults towards smoking, especially in those who have at higher risk of smoking and/or are exposed to these images. In line with this finding, Sargent et al reported that a positive attitude predicts the onset of smoking and smoking in general (18).

The major strength of the present study was that it was among the first studies in Iran evaluating tobacco-related posts and images on Persian-language pages of Instagram. However, our study had some limitations. We could not access the location where each image was posted. Moreover, since English is the primary language of Instagram, many Iranian users may have shared their posts in English and thus they were not included in this study.

**Conclusion**
The results of the current study represented the positive attitude of the audience towards tobacco-related Instagram posts. Most of these posts were tobacco-related products and advertisements. The most common captions were also associated with tobacco sales. Researchers and policymakers should look for approaches to reduce the volume of tobacco advertisements and promotional posts using counter-marketing on social media, especially on Instagram.

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**Authors’ Contribution**
All authors equally contributed to preparing this article.

**Conflict of Interest Disclosures**
The authors declare no competing interests.

**Ethical Statement**
This research was approved by the Ethics Committee of Hormozgan university of medical sciences (ethical code: IR.HUMS.REC.1400.123).

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**Informed Consent**
Not applicable.

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